Joint International Congress and Exhibition

ELECTRONICS GOES GREEN 2012+

TAking GREEN TO THE NEXT LEVEL

FINAL PROGRAM

In Partnership with the

CARE INNOVATION, Europe

In Cooperation with the World’s
“Going Green” Conference Series

ECO DESIGN, Japan

IEEE ISSST, USA

September 9 – 12, 2012
Dahlem Cube, Seminaris Campus Hotel
Berlin, Germany

Organized by
Fraunhofer Institute for
Reliability and Microintegration IZM, Berlin
Technische Universität Berlin,
Research Center for Microperipheric Technologies
Donations by

Organized by  Fraunhofer Institute for Reliability and Microintegration IZM, Berlin
             TU Berlin, Research Center for Microperipheric Technologies

In Cooperation with  The International CARE Electronics Office
                     EcoDeNet Japan
                     IEEE CPMT, TC Green Electronics
EGG 2012+

FINAL PROGRAM

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Taking Green to the Next Level

Sustainability in the electronics sector makes a vital contribution to safeguarding our future and that of coming generations. However, a more immediate threat is also demanding our attention – the effect of supply and demand on prices. Supplies of several metals and other materials essential in electronics manufacturing are beginning to dwindle and our industry is currently facing across-the-board price hikes. This means sophisticated solutions for technology and product development are required. Consequently, the Electronics Goes Green 2012+ conference is more intensely focusing on this issue and the response from industry and R&D. Consider this year’s conference motto “taking green to the next level” not by looking for one common “next level” for all, but by visualizing each market player on his own individual level. If all partners of the electronics value chain should then move just one step forward: image the intricate complexity involved.

Over the twelve years of the Electronics Goes Green conference series, electronics industry has come leaps and bounds in addressing sustainability issues. Despite this, underlying problems remain unsolved, as the electronics sector does not operate in a vacuum, but competes for resources with other industries and is affected by economic policies and political situations with which it often has had little involvement. EGG2012+ is the forum for discussing how to respond proactively and highlighting recent technology advancements that allow us to counter problems of scarcity. What demands are manufacturers making of the political context? What strategies are industry and research pursuing to minimize resource wastage? And how can recycling, which seemed to have almost been put on the back burner in terms of research and development in recent years, be optimized to make a more effective contribution to solving the issues facing electronics manufacturers?

EGG2012+ will also be the forum for its tried-and-true mix of legislative and policy discussions, the presentation of new scientific results and reports from the industry’s frontlines. At EGG2012+, we plan to take electronics in the green context to the next level, and welcome you to what will surely be the most stimulating four days of the year for those professionals concerned with ensuring the electronics sector can continue to improve quality of life for years to come.

The organizing team and I thank you for your participation!
Once more, the Electronics Goes Green is bringing together differing perspectives, from driving change to being driven, from advancing political goals to scientific moderation of what really constitutes environmental progress. Environmental protection and sustainability have become even more relevant in the electronics sector since the last Electronics Goes Green conference in 2008.

Sustainable Products and Technologies:
Best available or leading edge technologies and product solutions that reduce environmental impact through eco-design, energy efficiency and resource management, including recycling.

Governance:
Incentives for environment-friendly products and processes, green business models, voluntary agreements, social responsibility, and international issues related to environmental legislation.

System Thinking:
Today, electronic products are shifting from single function devices to networked products, generating considerable environmental and economic trade-offs. The improvement of the whole system requires meeting a variety of data monitoring, system modeling and life-cycle management challenges.

You are invited to come and enjoy the open atmosphere, share experiences, ideas and visions with experts from industry, academia, government and NGOs, and take advantage of the range of conference forums: exhibition, oral and poster presentations and hard-hitting debate at one of the conference’s most popular events, the Provoquium.
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Martina Creutzfeldt  mcc Agentur für Kommunikation GmbH, Germany
## Program at a Glance

### SUNDAY, SEPT. 9
- **11.00 – 14.15**: iNEMI Forum
  - Progress in Green Electronics (1)
- **14.45 – 18.00**: iNEMI Forum
  - Progress in Green Electronics (2)
- **18.30 – 20.30**:

### MONDAY, SEPT. 10
- **9.45 – 12.15**: Exhibition Opening
- **12.15 – 13.30**:
  - A.1 Producer Responsibility & WEEE
  - B.1 Green IT: Data Centres
- **13.30 – 15.30**:
  - A.2 Implementation of Producer Responsibility
  - B.2 Green IT: Networks
- **16.00 – 18.00**:
  - A.3 Resources for Electronics (1)
  - B.3 Green IT: Assessment Methodologies
- **19.00 – 22.00**:
  - A.4 Resources for Electronics (2)
  - B.4 Green IT: Sensor Networks

### TUESDAY, SEPT. 11
- **8.30 – 10.30**:
  - A.5 Closing Material Loops (1)
  - B.5 Micro-Energy Supplies
- **11.00 – 12.30**:
  - A.6 Closing Material Loops (2)
  - B.6 Product Life Time & Eco-Reliability
- **12.30 – 13.30**:
- **13.30 – 15.00**:
  - A.7 Carbon Footprint (1)
  - B.7 EoL Modelling Methods
- **15.30 – 17.30**:
  - A.8 Carbon Footprint (2)
  - B.8 Dematerialisation (1)
- **18.00 – 22.00**:
  - A.9 Dematerialisation (2)
  - B.9 the „Provoquium“

### WEDNESDAY, SEPT. 12
- **8.30 – 10.00**:
  - A.10 Carbon Footprint (3)
  - B.10 Dematerialisation (2)
- **10.30 – 12.00**:
  - A.11 Carbon Footprint (4)
  - B.11 Dematerialisation (3)
- **12.00 – 13.00**:
- **13.00 – 14.30**:
  - A.12 Carbon Footprint (5)
  - B.12 Dematerialisation (4)
- **14.30 – 16.00**:
  - A.13 Carbon Footprint (6)
  - B.13 Dematerialisation (5)
- **16.00 – 17.00**:

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*Room A Cambridge  Room B Sorbonne*
# Program at a Glance

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Event</th>
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| Sunday, Sept 9  | 11.00 – 14.15 | **InEMI Forum**
|             |        | **Progress in Green Electronics (1)**                                    |
|             |        | **Forum**
|             |        | **E-Waste in Developing and Transition Countries**                        |
|             |        | **Tutorial**
|             |        | **ADDRESS – e-Waste Global Collection**                                    |
|             | 14.45 – 18.00 | **InEMI Forum**
|             |        | **Progress in Green Electronics (2)**                                    |
|             |        | **Forum**
|             |        | **E-Waste in Developing and Transition Countries**                        |
|             |        | **Tutorial**
|             |        | **Carbon Footprinting for Electronics**                                   |
| Monday, Sept 10 | 9.45 – 12.15 | **Opening Ceremony**                                                     |
|             |        | **Opening Poster Session**                                               |
|             |        | **C.1 Ecodesign by Regulation**                                          |
|             |        | **C.2 RoHS 2.0**                                                         |
|             | 12.15 – 13.30 | **Exhibition Opening**                                                   |
|             |        | **Opening Poster Session**                                               |
|             |        | **C.3 Hazard Assessment**                                                |
|             |        | **C.4 Flame Retardants: Progress**                                       |
|             |        | **C.5 Flame Retardants: Solutions**                                      |
|             |        | **C.6 Nano Technologies**                                                |
|             | 13.30 – 15.30 | **Poster Session**                                                       |
|             |        | **D.1 WEEE Classification & Quantification**                            |
|             |        | **D.2 Recovery of Materials from WEEE**                                 |
|             |        | **D.3 WEEE Recycling Processes**                                         |
|             |        | **D.4 WEEE in International Context (1)**                               |
|             |        | **D.5 WEEE in International Context (2)**                               |
|             |        | **D.6 WEEE in International Context (3)**                               |
|             | 16.00 – 18.00 | **Poster Session**                                                       |
|             |        | **D.7 Take-back and Re-Use of WEEE (1)**                                 |
|             |        | **D.8 Take-back and Re-Use of WEEE (2)**                                 |
|             |        | **D.9 zeroWIN (1)**                                                      |
|             |        | **D.10 zeroWIN (2)**                                                     |
|             | 19.00 – 22.00 | **Reception Botanical Garden**                                           |
| Tuesday, Sept 11 | 8.30 – 10.30 | **Poster Session**                                                       |
|             |        | **A.3 Resources for Electronics (1)**                                    |
|             |        | **B.3 Green IT: Assessment Methodologies**                              |
|             |        | **C.3 Hazard Assessment**                                                |
|             |        | **D.3 WEEE Recycling Processes**                                         |
|             |        | **E.3 Ecodesign & Ecolabels (1): TV and IE**                            |
|             | 11.00 – 12.30 | **Poster Session**                                                       |
|             |        | **A.4 Resources for Electronics (2)**                                    |
|             |        | **B.4 Green IT: Sensor Networks**                                         |
|             |        | **C.4 Flame Retardants: Solutions**                                      |
|             |        | **D.4 WEEE in International Context (2)**                               |
|             |        | **E.4 Ecodesign & Ecolabels (2)**                                         |
|             |        | **A.5 Closing Material Loops (1)**                                       |
|             |        | **B.5 Micro-Energy Supplies**                                             |
|             |        | **C.5 Flame Retardants: Solutions**                                      |
|             |        | **D.5 WEEE in International Context (2)**                               |
|             |        | **E.5 Ecodesign & Ecolabels (3)**                                         |
|             | 12.30 – 13.30 | **Poster Session**                                                       |
|             |        | **A.6 Closing Material Loops (2)**                                       |
|             |        | **B.6 Product Life Time & Eco-Reliability**                             |
|             |        | **C.6 Nano Technologies**                                                |
|             |        | **D.6 WEEE in International Context (3)**                               |
|             |        | **E.6 Data & Compliance Management (1)**                                |
|             | 15.30 – 17.30 | **Poster Session**                                                       |
|             |        | **A.7 Carbon Footprint (1)**                                              |
|             |        | **B.7 EoL Modelling Methods**                                             |
|             |        | **C.7 Green Lighting (1)**                                               |
|             |        | **D.7 Take-back and Re-Use of WEEE (1)**                                 |
|             |        | **E.7 Data & Compliance Management (2)**                                |
|             | 18.00 – 22.00 | **Poster Session**                                                       |
|             |        | **A.8 Carbon Footprint (2)**                                              |
|             |        | **B.8 Dematerialisation (1)**                                             |
|             |        | **C.8 Green Lighting (2)**                                               |
|             |        | **D.8 Take-back and Re-Use of WEEE (2)**                                 |
|             |        | **E.8 Integrating Sustainability in SMEs**                               |
|             | 19.00 – 22.00 | **Closing Keynotes**                                                      |

**Get Together**

**Opening Ceremony**

- **Opening Poster Session**
  - **C.1 Ecodesign by Regulation**
  - **C.2 RoHS 2.0**
  - **C.3 Hazard Assessment**
  - **C.4 Flame Retardants: Progress**
  - **C.6 Nano Technologies**
  - **D.1 WEEE Classification & Quantification**
  - **D.2 Recovery of Materials from WEEE**
  - **D.3 WEEE Recycling Processes**
  - **D.4 WEEE in International Context (1)**
  - **D.5 WEEE in International Context (2)**
  - **D.6 WEEE in International Context (3)**

**Reception Botanical Garden**

**Poster Session**

- **A.3 Resources for Electronics (1)**
- **B.3 Green IT: Assessment Methodologies**
- **C.3 Hazard Assessment**
- **C.4 Flame Retardants: Progress**
- **C.5 Flame Retardants: Solutions**
- **C.6 Nano Technologies**
- **D.1 WEEE Classification & Quantification**
- **D.2 Recovery of Materials from WEEE**
- **D.3 WEEE Recycling Processes**
- **D.4 WEEE in International Context (1)**
- **D.5 WEEE in International Context (2)**
- **D.6 WEEE in International Context (3)**
- **A.4 Resources for Electronics (2)**
- **B.4 Green IT: Sensor Networks**
- **C.4 Flame Retardants: Solutions**
- **D.4 WEEE in International Context (2)**
- **D.5 WEEE in International Context (2)**
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- **A.5 Closing Material Loops (1)**
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- **C.5 Flame Retardants: Solutions**
- **D.5 WEEE in International Context (2)**
- **D.6 WEEE in International Context (3)**
- **A.6 Closing Material Loops (2)**
- **B.6 Product Life Time & Eco-Reliability**
- **C.6 Nano Technologies**
- **D.6 WEEE in International Context (3)**
- **E.3 Ecodesign & Ecolabels (1): TV and IE**
- **E.4 Ecodesign & Ecolabels (2)**
- **E.5 Ecodesign & Ecolabels (3)**
- **E.6 Data & Compliance Management (1)**
- **A.7 Carbon Footprint (1)**
- **B.7 EoL Modelling Methods**
- **C.7 Green Lighting (1)**
- **D.7 Take-back and Re-Use of WEEE (1)**
- **E.7 Data & Compliance Management (2)**
- **A.8 Carbon Footprint (2)**
- **B.8 Dematerialisation (1)**
- **C.8 Green Lighting (2)**
- **D.8 Take-back and Re-Use of WEEE (2)**
- **E.8 Integrating Sustainability in SMEs**
- **A.9 Dematerialisation (2)**
- **B.9 zeroWIN (1)**
- **C.9 Green Lighting (3)**
- **D.9 Take-back and Re-Use of WEEE (3)**
- **E.9 Scenarios and System Evaluation**
- **A.10 Dematerialisation (3)**
- **B.10 zeroWIN (2)**
- **C.10 Green Lighting (4)**
- **D.10 Take-back and Re-Use of WEEE (4)**
- **E.10 Scenarios and System Evaluation**
- **A.11 Dematerialisation (4)**
- **B.11 zeroWIN (3)**
- **C.11 Green Lighting (5)**
- **D.11 Take-back and Re-Use of WEEE (5)**
- **E.11 Scenarios and System Evaluation**
The International Electronics Manufacturing Initiative (iNEMI)
The International Electronics Manufacturing Initiative (iNEMI) is a not-for-profit, highly efficient R&D consortium of approximately 100 leading electronics manufacturers, suppliers, associations, government agencies and universities. Its mission is to forecast and accelerate improvements in the electronics manufacturing industry for a sustainable future. iNEMI roadmaps the future technology requirements of the global electronics industry, identifies and prioritizes technology and infrastructure gaps, and helps eliminate those gaps through timely, high-impact deployment projects.

iNEMI
2214 Rock Hill Road, Suite 110, Herndon, VA 20170-4214, USA
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Umicore Precious Metals Refining
A. Greinerstraat 14, 2660 Hoboken, Belgium
www.preciousmetals.umicore.com
SUNDAY, September 9, 11:00 – 18:00

Anyone interested in attending a tutorial or forum on Sunday without having already registered is asked to check that the event is not booked out, either by emailing or phoning the conference organizers before the day or by enquiring at the conference counter on-site.

11.00–18.00  **iNEMI Industry Forum on Progress in Green Electronics – Alignment on Best Practices and Future Focus**  
Bill Bader, Grace O’Malley, Bob Pfahl · iNEMI, USA

11.00–14.15  **Forum to Advance a Roadmap to Sustainable ICT**  
Wayne Rifer, Pamela Brody-Heine · Green Electronics Council, USA

11.00–14.15  **How to ADDRESS Improving Global Collection of e-Waste Flows**  
Jaco Huisman, Feng Wang · United Nations University, Germany
14.15 – 14.45 Joint Lunch Break

14.45 – 18.00 E-Waste Situation and Solutions in Developing Countries and Countries with Market Economies in Transition

A StEP Event Organized by Empa, GIZ and UNU

14.45 – 18.00 Carbon Footprinting for Electronics

Karsten Schischke, Marina Proske · Fraunhofer IZM, Germany

All forum and tutorial participants are invited to join the Get-Together directly after the forums & tutorials closing. For details, see the Events section.

Get Together & StEP Celebration

SUNDAY, September 9, 18:30 – 20:30

GET TOGETHER

A welcome reception will be held on Sunday at 6.30 pm for all already arrived conference participants and forum & tutorial participants. Join us in the hotel restaurant or, weather permitting, the hotel’s courtyard, for a BBQ and meet-and-greet. It’s a great chance to make a head start on getting to know your fellow delegates.

STEP CELEBRATION

This year, the Electronics Goes Green 2012+ Get-Together will be celebrating the 5th anniversary of the StEP initiative – Solving the E-waste Problem. Let’s get together to congratulate them!
Klaus-Dieter Lang, Fraunhofer IZM and Technische Universität Berlin

Klaus-Dieter Lang was appointed Director of Berlin’s Fraunhofer Institute for Reliability and Microintegration IZM in 2011 and is also Professor for “Nano Interconnect Technologies” at the Technical University of Berlin. He holds two doctoral degrees in Electrical Engineering from Humboldt University in Berlin and has held a number of different positions since joining Fraunhofer IZM in 1993. Prof. Lang is a member of numerous scientific boards and conference committees and has authored and co-authored 3 books and more than 130 publications on microelectronic packaging.

Hans-Joachim Otto, German Federal Ministry of Economics and Technology

Hans-Joachim Otto is Parliamentary State Secretary in the German Federal Ministry of Economics and Technology. A practicing lawyer specializing in commercial, inheritance and media law since 1984, he served as a member of the Hesse state parliament in the mid-1980s. Herr Otto was first elected to the Bundestag in 1990 and re-elected in 1998, serving continuously since. He has been Chairman of the Free Democratic Party (FDP) Federal Commission for Internet and Media since 1992 and of the FDP Rhine-Maine regional chapter since 1995. In 2010, Herr Otto was appointed Federal Government Coordinator for the Maritime Industry.

Christina Meskers, Umicore, Belgium

Christina Meskers obtained her M.Sc. degree in Metallurgical Engineering and her PhD from Delft University of Technology. In 2005 she visited NTNU in Trondheim as part of a 6-month Marie Curie scholarship for research purposes, followed by an internship at the University of Melbourne in 2008. Since then, Christina has been employed as Manager of Business Development for Umicore Precious Metals Refining, where she is responsible for market research, internal projects related to Umicore products and services and projects with industry associations and (academic) research partners on recycling and sustainable materials management.

Carlos Lee, EPIC, Belgium

Carlos Lee is Director General at EPIC, Europe’s leading photonics industry association. As part of the EPIC mission, Carlos works closely with industrial photonic companies to ensure a vibrant and competitive ecosystem by maintaining a strong network and acting as a catalyst and facilitator for technological and commercial advancement. He brings with him a strong background in microelectronics, which was acquired through several management positions held at the international association SEMI. He has been responsible in Europe for the SEMI International Standards program and managed technical and executive programs. Carlos has a BBA in Finance and an MBA in Leadership & Change Management.

Fatma Fekih-Ahmed Kilani, Independent Web Consultant, Tunisia

A Computer Engineering graduate of the Ecole Polytechnique de Lausanne, Fatma Fekih Ahmed Kilani coordinated Tunisia’s first professional internet and web team. She also represented the Arabic-speaking world in the Multilingualism Working Group at the Web Consortium from 1993 to 1997. She has close to 20 years experience in designing, creating and programming web and multimedia solutions at national and international level. Today, Fatma Fekih Ahmed Kilani works as an information technology and communication (offline and online) consultant. Since 2010, she has been actively participating in the events commonly known as the Arab Spring through Facebook, Tunisia’s most popular social networking site.

Scott O’Connell, Dell, USA (Conference closing Keynote)

As Director of Environmental Affairs, Scott O’Connell manages a global team responsible for Dell’s environmental strategy, worldwide product compliance, and Design for Environment programs to increase sustainable product and packaging leadership across its entire portfolio. His role within Dell also includes engagement with leading industry partners to help influence global environmental regulations and standards, as well as development of new product environmental technologies and strategies. Scott is also one of the primary authors of Dell’s annual Corporate Responsibility. Scott received a BS from the University of Texas and an MS in Environmental Management from Duke University.
### Opening Keynotes

**MONDAY, September 10, 9:45 – 12:15**

**9.45** *Introduction and Welcome to Electronics Goes Green 2012+*  
Klaus-Dieter Lang · Fraunhofer IZM, Berlin, Germany; Technische Universität Berlin, Germany

**10.15** *Green IT Energy Efficiency for Systems*  
Hans-Joachim Otto · Federal Ministry of Economics and Technology, Berlin, Germany

**10.40** *Tackling the Resource Challenge – How to Take the Electronics Life Cycle to the Next Level*  
Christina Meskers · Umicore, Hoboken, Belgium

**11.10** *Blue Semiconductors and Photonics*  
Carlos Lee · EPIC – European Photonics Industry Consortium, Brussels, Belgium; former Director General at SEMI Europe, Brussels, Belgium

**11.45** *The Role of IT for Societal Transformation Towards Democracy*  
Fatma Fekih-Ahmed Kilani · Independent Web Consultant, Tunis, Tunisia

**12.15** *Opening of Exhibition and Poster Session, Lunch Break*
A.1 PRODUCER RESPONSIBILITY AND WEEE DIRECTIVE

Session Chair: Oswald, Irina · University of Augsburg, Germany

**13.30** Europe Leads the Way: Mechanisms of EEE-Related Regulation in the European Union
Ellinghaus, Ulrich · Baker & McKenzie, Germany

**14.00** Enablers and Barriers for Producer Responsibility in the Electrical and Electronic Equipment Sector
Besiou, Maria1; Van Wassenhove, Luk N.2; Williams, Ian3; Ongondo, Francis3; Curran, Tony3; O’Connor, Clementine4; Yang, Mona5; Dietrich, Johannes6; Marwede, Max6; Gallo, Maitane7; Arnaiz, Sixto7; Woolman, Tim8; Kopacek, Bernd9; Obersteiner, Gudrun10
1Kuehne Logistics University, Hamburg, Germany; 2INSEAD, Fontainebleau, France; 3University of Southampton, UK; 4BIO Intelligence Service, Paris, France; 5AUO, Hsinchu, Taiwan, Republic of China; 6Technische Universität Berlin, Germany; 7Fundacion GAIKER, Zamudio, Spain; 8University for the Creative Arts, Surrey, UK; 9Austrian Society for Systems Engineering and Automation, Vienna, Austria; 10University of Natural Resources and Applied Life Sciences, Vienna, Austria

Altvater, Meike; Brandmann, Christina · 1WEEE Services GmbH, Germany

**15.00** Producer Responsibility When WEEE has a Net Value
Seager, Daniel1; Hieronymi, Klaus2; McIntyre, Kirstie3; Guilcher, Herve4; Janse van Rensburg, Ruben5
1Hewlett-Packard Co., Amstelveen, Netherlands; 2Hewlett-Packard Co., Hamburg, Germany; 3Hewlett-Packard Co., London, United Kingdom; 4Hewlett-Packard Co., Grenoble, France; 5Hewlett Packard Co., Johannesburg, South Africa
B.1 GREEN IT:
DATA CENTRES

Session Chair: Stobbe, Lutz · Fraunhofer IZM, Berlin, Germany

13.30 Energy Efficiency in Datacenters: The Esselunga Case Study from the IEE-PrimeEnergy IT Research Project
Roscetti, Andrea¹; Pagliano, Lorenzo¹; Tirloni, Roberto²; Gregoli, Stefano²
¹Politecnico di Milano – eERG, Italy; ²Esselunga S.p.A., Italy

14.00 Towards a Multi-Level Green Performance Indicator Framework to Improve Energy Efficiency of Data Center Operation – A Resource Usage-Based Approach
Schödwell, Björn; Wilkens, Marc; Erek, Koray; Zarnekow, Rüdiger
Technische Universität Berlin, Germany

14.30 Environmental Performance of Data Centres – A Case Study of the Swedish National Insurance Administration
Honée, Caspar; Hedin, Daniel; St-Laurent, Jasmin; Fröling, Morgan
Mid Sweden University, Sweden

15.00 Energy Consumption and Quantities of Materials in German Data Centres
Hintemann, Ralph; Fichter, Klaus · Borderstep Institut, Germany

C.1 ECODESIGN BY REGULATION (EUP/ERP)

Session Chair: Rifer, Wayne · Green Electronics Council, Portland, USA

Dietrich, Sascha¹; Akkermann, Floris²
¹Federal Ministry of Economics and Technology (BMWi), Germany; ²Bundesanstalt für Materialforschung und -prüfung (BAM), Germany

14.00 Eco-design Self-Regulation: A Price Too High?
Cassells, Sheila; Mattei, Adriana · Digital Interoperability Forum, Belgium
14.30 **Open Questions on Standby and Networked Standby**  
Nissen, Nils F.1; Stobbe, Lutz1; Lang, Klaus-Dieter1,2  
1 Fraunhofer IZM, Berlin, Germany; 2 Technische Universität Berlin, Germany

15.00 **Harmonised Approach to Address Standby Power Losses Through International Policy**  
Mudgal, Shailendra; Muehmel, Kurt; Labouze, Eric  
BIO Intelligence Service, France

**D.1 CLASSIFICATION AND FLOW QUANTIFICATION OF WEEE**  
Session Chair: Terazono, Atsushi  
National Institute for Environmental Studies, Tsukuba, Japan

13.30 **A Systematic and Compatible Classification of Waste Electrical and Electronic Equipment**  
Huisman, Jaco1,2; Wang, Feng1,2; Baldé, Kees3  
1 United Nations University, Germany; 2 Delft University of Technology, the Netherlands; 3 Statistics Netherlands, the Netherlands

14.00 **An Environmental and Economic Analysis of e-Waste Recycling Based on the Japanese Experience – Focusing on Flow Estimation**  
Yoshida, Fumikazu1; Yoshida, Haruyo2  
1 Hokkaido University, Japan; 2 Sapporo University, Japan

14.30 **WEEE Flows in Germany and the Perspective of Product Responsibility for Efficient Use of Resources**  
Sander, Knut  
Ökopol GmbH, Germany

15.00 **From CRT to Flat Displays – Consequences for Collection and Recycling**  
Chancerel, Perrine1; Deubzer, Otmar2; Nissen, Nils F.2; Lang, Klaus-Dieter1,2  
1 Technische Universität Berlin, Germany; 2 Fraunhofer IZM, Berlin, Germany
**E.1 CORPORATE RESPONSIBILITY AND STAKEHOLDER INTERACTION**  
*Room E*  
13.30–15.30

**Session Chair:** Eagan, Patrick D. · University of Wisconsin-Madison, Madison, USA

**13.30** Challenges of Environmental Information Disclosure in the Electronics Industry – The Lesson from Taiwan’s Optoelectronic Plant Wastewater Pollution Dispute  
*Tu, Wen-Ling* · National Chengchi University, Taiwan, Republic of China

**14.00** Customer Demand for ‘Green’ Product Information – What Customers Request to make Informed Purchase Decision  
*Wendschlag, Hans* · Hewlett-Packard, Sweden

**14.30** Bottom-Up Organized Recycling Networks as Strategies for Corporate Sustainability  
*Heyer, Steffen*; *Krämer, Peter*; *Ueberschaar, Maximilian*; *Götze, Ramona*;  
*Walter, Gotthard*; *Rotter, Vera Susanne*; *Flamme, Sabine*; *Seliger, Günther*  
1 FH Münster, Germany; 2 Technische Universität Berlin, Germany

**15.00** Persuasive Design for LOHAS Products with Physical Activity  
*Shih, Li-Hsing*; *Hsing, Han-En* · National Cheng Kung University, Taiwan, Republic of China

**MONDAY, September 10**

**A.2 IMPLEMENTATION OF PRODUCER RESPONSIBILITY**  
*Room A*  
16.00–18.00

**Session Chair:** Smit, Eelco · Philips Consumer Lifestyle, the Netherlands

**16.00** Methodology to Measure Corporate Performance in e-Waste Collection and Recycling Programs  
*Oswald, Irina*; *Reller, Armin* · University of Augsburg, Germany

**16.30** Business Model for EPR-Based e-Waste Management System  
*Jain, Amit*; *Deshpande, Ajay*  
1 IRG Systems South Asia Pvt. Ltd., India; 2 Maharashtra Pollution Control Board, India
17.00  **How Do the Biggest IT Companies Perform on Recycling Issues?**
Rühle, Philipp  ·  oekom research AG, Germany

17.30  **Towards IPR for B2C WEEE: Can RFID Step up to the Challenge?**
Hickey, Stewart¹; Fitzpatrick, Colin¹; O’Connell, Maurice¹; Besiou, Maria²; 
Van Wassenhove, Luk N.²; Middendorf, Andreas³; Kopacek, Bernd⁴
¹University of Limerick, Ireland; ²INSEAD, Fontainebleau, France; ³Fraunhofer IZM, Berlin, Germany; 
⁴Austrian Society for Systems Engineering and Automation, Austria

### B.2 GREEN IT: NETWORKS

**Session Chair:** Lee, Kun Mo  ·  Ajou University, Suwon, South Korea

16.00  **LCA of Data Transmission and IP Core Networks**
Malmodin, Jens¹; Lundén, Dag²; Nilsson, Mikael²; Andersson, Greger²
¹Ericsson AB, Sweden; ²TeliaSonera AB, Sweden

16.30  **Green IT: A Holistic Approach for Identifying Sustainable Performance**
Herrmann, Constantin; Saraev, Alexandra; Scheidt, Lutz-Günther 
PE INTERNATIONAL AG, Germany

17.00  **Visualizing the Effects of Power Management Algorithms for Mobile Networks under Realistic Conditions**
Göndör, Sebastian¹; Uzun, Abdulbaki¹; Bayer, Nico²; Kollecker, Lars²; 
Küpper, Axel¹
¹Telekom Innovation Laboratories, Technische Universität Berlin, Germany; ²Telekom Innovation Laboratories, Germany

17.30  **Energy Efficient Network Equipment for Data Centers**
Schloesser, Alexander¹; Stobbe, Lutz²; Nissen, Nils F.²; Schaeppi, Bernd³; 
Lang, Klaus-Dieter¹,²
¹Technische Universität Berlin, Germany; ²Fraunhofer IZM, Berlin, Germany; ³Austrian Energy Agency, Austria
C.2 ROHS 2.0
Session Chair: Stutz, Markus · Dell, Frankfurt/Main, Germany

16.00 Overview of RoHS 2.0 and Status of Exemptions
Deubzer, Otmar; Nissen, Nils F.; Lang, Klaus-Dieter · Fraunhofer IZM, Berlin, Germany

16.30 Practical Application of CENELEC Standard EN 50581:2012 to Generate Technical Documentation for RoHS2 Conformity Assessment
Turnbull, Aidan · ENVIRON International, United Kingdom

17.00 RoHS-Regulated Substances in Mixed Plastics from Waste Electrical and Electronic Equipment
Müller, Esther; Schluep, Mathias; Wäger, Patrick A.
Swiss Federal Laboratories for Materials Science and Technology (Empa), Switzerland

17.30 Chemicals in Products:
What Happens Globally After RoHS Recast and EU REACH?
Yoon, Duk-Chan¹; Park, DaeYoung²
¹ Young & Global Partners, Belgium; ² Ghent University, Young & Global Partners, Belgium

D.2 RECOVERY OF MATERIALS FROM WEEE
Session Chair: Huisman, Jaco · Huisman Recycling Research, Eindhoven, the Netherlands

16.00 The Benefits of e-Waste Recycling in the Netherlands
Leijting, Jorrit · PRe, the Netherlands

16.30 Challenges for the Recovery of Critical Metals from Waste Electronic Equipment – A Case Study of Indium in LCD Panels
Götze, Ramona; Rotter, Vera Susanne · Technische Universität Berlin, Germany

17.00 Challenges in Promoting 3R of Plastics of EoL Electronics Products
Matsumoto, Mitsutaka; Kamo, Tohru; Masui, Keijiro · AIST, Japan
17.30 **Recycling of High Performance Polymers from Electronic Scrap**  
Schlummer, Martin; Mäurer, Andreas · Fraunhofer IVV, Freising, Germany

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E.2 **SOCIAL INNOVATION APPROACHES**

**Room E**  
**16.00** Green Crowdsourcing: The Role of Social Media for Growing Eco-product Demand and Eco-innovation  
Mogensen, Anna¹; Poensgen, Amei²; Figge, Catrin³; Campanella, Valentina¹  
¹PanOrder Eco-Consulting, Germany; ²Faircustomer.ch, Switzerland; ³Content Press, Germany

**16.30** Crafting Environmental Change Agents – An Ecosystem Approach  
Singhal, Pranshu · Nokia India Private Limited, Gurgaon, India

**17.00** Building a Competency Model for Sustainability  
Eagan, Patrick; Gustafson, Marty; Vieth, Carl  
University of Wisconsin-Madison, United States of America

**17.30** Seeds4Green: An Open Collaborative Internet Platform for LCA Studies  
Teulon, Helene; Canaguier, Benjamin · Gingko 21, France

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**TUESDAY, September 11**

A.3 **RESOURCES FOR ELECTRONICS (1)**

**Room A**  
**8.30** Resource Use and Efficiencies of Major Materials Used in Electrical and Electronic Equipment (EEE)  
Talens Peiró, Laura; Ayres, Robert U. · INSEAD Social Innovation Centre, France

**9.00** Germany – A Source of Raw Materials  
Fechner, Rita; Legler, Solveig; Engelmann, Tobias · TechProtect GmbH, Germany
9.30  **U.S. Conflict Minerals Regulations and the Electronics Industry**  
Abrams, Fern · IPC, United States of America

10.00  **Conflict-Free Minerals Supply Chain to Electronics**  
Young, Steven B.; Dias, Goretty · University of Waterloo, Canada

B.3  **GREEN IT: ASSESSMENT METHODOLOGIES**  

**Session Chair:** Umeda, Yasushi · Osaka University, Osaka, Japan

8.30  **Opportunities and Limitations of Using Life Cycle Assessment Methodology in the ICT Sector**  
Guldbrandsson, Fredrik; Bergmark, Pernilla · Ericsson AB, Sweden

9.00  **Metrics for Energy Efficiency Assessment in Data Centers and Server Rooms**  
Schaeppi, Bernd¹; Bogner, Thomas¹; Schloesser, Alexander²; Stobbe, Lutz³; Assuncao, Marcos⁴  
¹Austrian Energy Agency, Austria; ²Technische Universität Berlin, Germany; ³Fraunhofer IZM, Berlin, Germany; ⁴INRIA, France

9.30  **Integrated Life Cycle Assessment of End-of-Life of Computers**  
Srivastava, Amitabh Kumar; Yadav, Sudeep  
Bundelkhand Institute of Engineering & Technology, Jhansi, India

10.00  **Environmental Streamlined Assessment in LCA of Information Technology Products: A Case of LCD Displays**  
Duque Ciceri, Natalia; Olivetti, Elsa A.; Kirchain, Randoph E.  
MIT, United States of America
Session Program

C.3  HAZARD ASSESSMENT AND QUANTITATIVE CHEMICAL ANALYSIS

**Room C**  
**8.30–10.30**

**Session Chair:** Handwerker, Carol · Purdue University, West Lafayette, USA

**8.30**  
Reducing Risk by Reducing Hazard: Use of Chemical Hazard Screening as the First Step in the Assessment Process  
Wendschlag, Hans; Robertson, Cory; Holder, Helen; Wray, Curtis  
Hewlett-Packard, Sweden

**9.00**  
Overcoming the Difficulties of Accurate Hazard Assessment for Electronic Devices: A Life Cycle Hazard Projection Approach  
Eisenberg, Daniel A.; Yu, Mengjing; Lam, Carl W.; Ogunseitan, Oladele A.; Schoenung, Julie M.  
1University of California, Davis, United States of America; 2University of California, Irvine, United States of America

**9.30**  
A New Approach for Determination of Hexavalent Chromium Weight Percentage in Chromate Conversion Coatings  
Noguchi, Michiko; Ozaki, Mitsuo; Hayashi, Nobuyuki  
1FUJITSU Laboratories Ltd., Japan; 2FUJITSU Quality Laboratory Ltd., Japan

**10.00**  
Application of X-ray Absorption Fine Structure Method for the Quantitative Analysis of Hexavalent Chromium in Electronic Products  
Oki, Mitsuhiro; Morimoto, Sayaka; Yoshiki, Masahiko; Takenaka, Miyuki  
Toshiba Corporation, Japan

D.3  IMPROVING WEEE RECYCLING PROCESSES

**Room D**  
**8.30–10.30**

**Session Chair:** Boeni, Heinz W. · Empa, St. Gallen, Switzerland

**8.30**  
Towards Efficient End-of-Life Processes of Electrical and Electronic Waste with Passive RF Communication  
Rüdiger, David; Hohaus, Christian; Uriarte, Amaia; Ibañez, Nora; Guarde, Dorleta; Marquinez, Ingrid; Manjon, David; Kovacs, Peter  
1Fraunhofer IML, Dortmund, Germany; 2Inkoa Sistemas, Spain; 3Indumetal, Spain; 4Gaiker, Spain; 5Electro-Coord, Hungary
9.00  Calculation of Recyclability on the Product Level – Challenges for a Smart Phone  
Riess, Michael1; Olson, Bill2  
1VDE Prüf- und Zertifizierungs institut, Germany; 2Motorola Mobility Inc., USA

9.30  Increasing Sustainability of LCD Recycling  
Felix, Johan1; Tunell, Helena1; Letcher, Bill1; Mangold, Stephan1; Yang, Jiaxu2; Retegan, Teodora2; Grammatikas, Anton3; Rydberg, Tomas4; Ljungkvist, Hanna4  
1Chalmers Industriteknik, Sweden; 2Chalmers University of Technology, Sweden; 3BOID, Sweden; 4IVL Swedish Environmental Research Institute, Sweden

10.00  Recycling Sustainability Evaluation: Case Study of LCD TVs  
Vanegas, Paul1, 2; Peeters, Jef R.1; Dewulf, Wim1, 3; Cattrysse, Dirk1; Duffou, Joost R.1  
1Centre for Industrial Management Traffic & Infrastructure, KU Leuven, Belgium; 2Universidad de Cuenca, Ecuador; 3Group T International University College Leuven, Belgium

E.3  ECODESIGN AND ECOLABELS (1): TV AND IMAGING EQUIPMENT  
Room E 8.30–10.30

Session Chair: Stobbe, Lutz · Fraunhofer IZM, Berlin, Germany

8.30  EU Ecodesign and Labelling Regulations for TVs: Is the Picture Half Full or Half Empty?  
Toulouse, Edouard1; Sivitos, Stamatis1; Arditi, Stéphane2; Reintjes, Norbert3; Spengler, Laura3  
1ECOS (European Environmental Citizens’ Organisation for Standardisation), Belgium; 2European Environmental Bureau (EEB), Belgium; 3Ökopol GmbH, Germany

9.00  Two New Standards in the IEEE 1680 (EPEAT) Family of Standards: Imaging Equipment and Televisions  
Brody-Heine, Pamela; Rifer, Wayne · Green Electronics Council, United States of America

9.30  Promoting the Frontrunners – EU Ecolabel Criteria Requirements on the Use of Substances for Printers, Copiers and Multifunctional Devices (MFDs)  
Kougoulis, Jiannis1; Kaps, Renata1; Weber, Roland2; Posner, Stefan3  
1European Commission Joint Research Centre/Institute for Prospective Technological Studies, Spain; 2POPs Environmental Consulting, Göppingen, Germany; 3Swerea IVF AB, Mölndal, Sweden
10.00 **Rethinking Eco-design Priorities – The Case of the Econova Television**
Bakker, Conny¹; Ingenegeren, Ridzert¹; Devoldere, Tom²; Tempelman, Erik¹; Huisman, Jaco¹,³; Peck, David Phillip¹

¹TU Delft, the Netherlands; ²Philips Innovative Applications, Belgium; ³United Nations University, Germany

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**TUESDAY, September 11**

### A.4 RESOURCES FOR ELECTRONICS (2)

**Room A**

11.00 **Evaluating Risks of Copper Depletion Based on Sustainability Scenarios**
Inoue, Yuta¹; Kishita, Yusuke²; Fukushige, Shinichi¹; Kobayashi, Hideki²; Umeda, Yasushi¹

¹Department of Mechanical Engineering, Osaka University, Osaka, Japan; ²Center of Environmental Innovation Design for Sustainability, Osaka University, Osaka, Japan

11.30 **Measuring Resource Efficiency and Criticality Beyond Geologic Availability**
Berger, Markus; Schneider, Laura; Finkbeiner, Matthias

Technische Universität Berlin, Germany

12.00 **Economical Evaluation of Recycling System for Rare-Earth Magnets**
Akahori, Tomohiko; Hiroshige, Yuzo

Hitachi Ltd., Japan

### B.4 GREEN IT: SENSOR NETWORKS

**Room B**

11.00 **Power Monitoring Using Wireless Sensor Nodes as an Effective Contribution to Power Saving in Convenience Stores**
Fujimoto, Jun¹; Suzuki, Akio¹; Furusawa, Shingo²

¹National Institute of Advanced Industrial Science and Technology, Japan; ²Seven-Eleven Japan
11.30 **Urban Area Air Quality Monitoring via Mobile Sensor Network Systems**  
Ani, Chukwuchebe Maximilian¹; Anih, Ubammadusinachi Godfrey²  
¹Nanjing University of Aeronautics and Astronautics, People’s Republic of China; ²Hohai University, People’s Republic of China

12.00 **Life Cycle Assessment and Eco-design of a Textile-based Large-area Sensor System**  
Köhler, Andreas R.¹; Lauterbach, Christl²; Steinhage, Axel²  
¹Delft University of Technology, the Netherlands; ²FutureShape GmbH, Germany

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**C.4 FLAME RETARDANTS: PROGRESS OF DEVELOPMENTS**  
Room C  
11.00–12.30

**Session Chair:** Hu, Allen H. · National Taipei University of Technology, Taipei, Taiwan

11.00 **iNEMI HFR-Free Leadership Project – An Investigation to Identify Technology Limitations Involved in Transitioning to HFR-Free PCB Material**  
Tisdale, Stephen¹; Davignon, John¹; Hall, Stephen H.¹; Leddige, Mike¹; Hinaga, Scott²; Senk, David²  
¹Intel Corporation, United States of America; ²Cisco, United States of America

11.30 **Process Based Greenhouse Gas Inventory of Representative Flame Retardants for FR4 Boards**  
Reallff, Matthew J.; Overcash, Michael; Hu, Zushou  
Georgia Institute of Technology, United States of America

12.00 **Global Regulatory Developments and Sustainability of Flame Retardants**  
Landry, Susan Duncan; Dawson, Raymond B.; Kohl, Florian  
Albemarle Corporation, United States of America
D.4 WEEE IN INTERNATIONAL CONTEXT (1)  
Room D  
11.00 – 12.30

Session Chair: Deubzer, Otmar · Fraunhofer IZM, Berlin, Germany

11.00 E-Waste Recycling in Asia: Process Classification, Environmental Effect and Knowledge Sharing
Terazono, Atsushi; Oguchi, Masahiro; Yoshida, Aya; Takigami, Hidetaka; Agusa, Tetsuro; Ballesteros, Florencio C.; Fujimori, Takashi
1National Institute for Environmental Studies, Japan; 2Ehime University, Japan; 3University of the Philippines Diliman, The Philippines; 4Kyoto University, Japan

11.30 Where are WEEE in Africa?
Schluep, Mathias; Terekhova, Tatiana; Manhart, Andreas; Müller, Esther; Rochat, David; Osibanjo, Oladele
1Swiss Federal Laboratories for Materials Science and Technology (Empa), Switzerland; 2The Secretariat of the Basel Convention (SBC), Switzerland; 3Öko-Institut e. V., Germany; 4SOFIES SA, Switzerland; 5Basel Convention Coordinating Centre (BCCC) for the African Region, Nigeria

12.00 Waste Electrical and Electronic Equipment in China – A Country Report
Wang, Feng; Kuehr, Ruediger; Li, Jinhui
1United Nations University, Institute for Sustainability and Peace – Operating Unit SCYCLE, Bonn, Germany; 2Faculty of Industrial Design Engineering, Delft University of Technology, Delft, the Netherlands; 3Tsinghua University, Beijing, People’s Republic of China

E.4 ECODESIGN AND ECOLABELS (2)  
Room E  
11.00 – 12.30

Session Chair: Fitzpatrick, Colin · University of Limerick, Ireland

11.00 P.E.P. Ecopassport – An ISO 14025 Compliant Program
Vital, Xavier; Theoleyre, Serge; Lizotte, Raymond
1SGS North America, United States of America; 2Schneider Electric, France; 3APC by Schneider Electric, United States of America

11.30 Corporate Sustainability – Green Image via Company-Related Environmental Labelling
Lückefett, Hans-Jochen; Binder, Ute · K & L GmbH, Germany
5.00 Green Electronics? An LCA Based Study of Eco-labeling of Laptop Computers
St-Laurent, Jasmin; Hedin, Daniel; Honée, Caspar; Fröling, Morgan · Mid Sweden University, Sweden

TUESDAY, September 11

A.5 CLOSING MATERIAL LOOPS IN THE EXTENDED VALUE CHAIN (1)

Session Chair: Rotter, Vera Susanne · Technische Universität Berlin, Germany
Chancerel, Perrine · Technische Universität Berlin, Germany

13.30 Recycling of Critical Resources – Upgrade Introduction
Rotter, Vera Susanne; Chancerel, Perrine · Technische Universität Berlin, Germany

14.00 Recycling of Critical Metals from End-of-Life Electronics
Manhart, Andreas; Buchert, Matthias; Bleher, Daniel; Pingel, Detlef · Öko-Institut e. V., Germany

14.30 Opportunities and Limits of WEEE Recycling – Recommendations to Product Design from a Recyclers Perspective
Reuter, Markus · Outotec, Finland

B.5 MICRO-ENERGY SUPPLIES AND ENERGY HARVESTING

Session Chair: Schoenung, Julie M. · University of California Davis, USA

13.30 Energy Harvesting on its Way to a Reliable and Green Micro Energy Source
Benecke, Stephan¹; Rückschloss, Jana²; Nissen, Nils F.²; Lang, Klaus-Dieter¹.²
¹Technische Universität Berlin, Germany; ²Fraunhofer IZM, Berlin, Germany

Abd. Rahman, Airul Azha; Abdul Rashid, Nor’azah; Abd. Aziz, Aiman Sajidah; Witjaksono, Gunawan · MIMOS, Malaysia
**Sessions**

**C.5 FLAME RETARDANTS: SOLUTIONS**

**Room C**

**13.30** Non-Halogenated Phosphorus, Inorganic and Nitrogen Flame Retardants for Electronics: Update on Market Situation, Drivers and Trends

Beard, Adrian; Klimes, Michael; Wietschorke, Ulrich · pinfa c/o Cefic, Belgium

**14.00** Recycling of Plastics Containing Flame Retardants in Electronic Waste – A Technical and Environmental Challenge for a Sustainable Solution

Tange, Lein¹; Hofland, Willem¹; Salémis, Philippe²; van Houwelingen, Jan³

¹ICL-IP Europe, the Netherlands; ²Cefic, the European Chemical Industry Council, Belgium; ³Recycling Consult BV, the Netherlands

**14.30** Flame Retardants for Engineering Thermoplastics used in Electric and Electronic Equipment like Connectors and Switches

Toepfer, Oliver¹; Clauss, Margot²; Futterer, Thomas³; Schmitt, Elmar⁴

¹Nabaltec AG, Germany; ²BASF Schweiz AG, Switzerland; ³Chemische Fabriken Budenheim, Germany; ⁴Clariant Produkte (D) GmbH, Germany

**D.5 WEEE IN INTERNATIONAL CONTEXT (2)**

**Room D**

**13.30** Development and Utilization of Forecasting Model for Strategically Planning on e-Waste Management in Thailand

Annanon, Kittinan¹; Tangpaitoon, Surus²; Popuang, Chirapat²; Wangpattarapong, Kiattiporn²; Thongpan, Nawanuch³

¹National Metal and Materials Technology Center, Thailand; ²Electrical and Electronics Institute, Thailand; ³Pollution Control Department, Thailand
14.00 Understanding the Role of Bulk Consumers in e-Waste Management: The Case of India’s IT Sector
Subramanian, Logakanthi · University of Manchester, United Kingdom

14.30 Resource Recycling of Waste Electronic and Electrical Products in Taiwan
Shen, Shu-hung1; Wan, Terng-Jou2; Cheng, Chiung-Yi2; Huang, Chung-Fu2; Shen, Shu-Min3
1Environmental Protection Administration (EPA), Executive Yuan, Taipei, Taiwan, Republic of China;
2National Yunlin University of Science and Technology (YunTech), Yunlin, Taiwan, Republic of China;
3National Chung Cheng University, Chiayi, Taiwan, Republic of China

E.5 ECODESIGN AND ECOLABELS (3) Room E 13.30–15.00

Session Chair: Stutz, Markus · Dell, Frankfurt/Main, Germany

13.30 Eco-Points – Ecological Advice for Mobile Phone Purchasers
Wildbolz, Caroline1; Berking, Daniel1; Guggisberg, Michael2
1Foundation myclimate, Switzerland; 2Swisscom AG, Switzerland

14.00 European Product Policies on the Environmental Performance of Household Washing Machines – Synergies and Coherence Investigated
Zacho, Kristina Overgaard; Bundgaard, Anja Marie · Aalborg University, Denmark

14.30 Green Electronic Products in India – Lessons from the BEE Star Label and the Ecomark Scheme
Henzler, Mikael P.1; Strasser, Cosima1; Eisinger, Frederik1; Chaturvedi, Ashish2; Raghupathy, Lakshmi2; Arora, Rachna2
1adelphi, Germany; 2Gesellschaft für Internationale Zusammenarbeit (GIZ), India
A.6 CLOSING MATERIAL LOOPS IN THE EXTENDED VALUE CHAIN (2)  
Room A 15.30–17.30

Session Chairs: Rotter, Vera Susanne · Technische Universität Berlin, Germany  
Chancerel, Perrine · Technische Universität Berlin, Germany

15.30 Resource Scarcity: An OEM Perspective  
Smit, Eelco1; Scheijgrond, Jan-Willem2; Severin, Jan2  
1Philips Consumer Lifestyle, the Netherlands; 2Philips, the Netherlands

16.00 Eco-design Opportunities for Critical Material Supply Risks  
Peck, David Phillip; Bakker, Conny · TU Delft, the Netherlands

16.30 Towards a Comprehensive Recovery System for Critical Metals in Switzerland  
Wäger, Patrick A.; Widmer, Rolf; Blaser, Fabian; Müller, Esther; Stamp, Anna;  
Boeni, Heinz W. · Swiss Federal Laboratories for Materials Science and Technology (Empa), Switzerland

17.00 Recycling of Critical Resources – Moderated Discussion  
Rotter, Vera Susanne · Technische Universität Berlin, Germany

B.6 PRODUCT LIFE TIME AND ECO-RELIABILITY  
Room B 15.30–17.30

Session Chair: Pfahl, Robert C. · iNEMI, Herndon, USA

15.30 Eco-Reliability as a new Approach of Multi-Criteria Optimisation  
Middendorf, Andreas1,2; Nissen, Nils F.1; Stobbe, Lutz1; Wittler, Olaf1;  
Lang, Klaus-Dieter1,2  
1Fraunhofer IZM, Berlin, Germany, 2Technische Universität Berlin, Germany

16.00 Use Phase Analysis of PCs using S.M.A.R.T to better inform LCA Studies  
Hickey, Shane1; Fitzpatrick, Colin1; Hickey, Stewart1; Duffy, Liam1; Reddy, Martin2  
1University of Limerick, Ireland; 2Rehab Recycle, Dublin, Ireland
16.30 Achieving Greener and Lower Cost Data Centers through PHM
Dai, Jun; Pecht, Michael; Ohadi, Michael
University of Maryland, College Park, United States of America

17.00 Improving e-Waste Recovery with Energy Efficiency Information of Products
Ng, Yen Ting1, 2; Lee, Hui Mien1; Lu, Wen Feng2; Low, Jonathan Sze Choong1
1 Singapore Institute of Manufacturing Technology, A*STAR, Singapore; 2 National University of Singapore, Singapore

C.6 NANO TECHNOLOGIES

Session Chair: Umeda, Yasushi · Osaka University, Osaka, Japan

15.30 Nanomaterials in Existing and Emerging Chemical Regulation of China, Japan, Korea, U.S., and the European Union
Park, Yoon-Mi1; Park, DaeYoung2 · 1 Young & Global Partners, Belgium; 2 Ghent University, Young & Global Partners, Belgium

16.00 Recent Advances in Anisotropic Conductive Adhesives (ACAs) Technology for Green Electronic Assembly
Paik, Kyung W. · KAIST, South Korea

16.30 Influence of Modified Carbon Nanotubes Addition to SAC Solder Paste on Solder Joints Properties and Their Thermal and Mechanical Fatigue
Sitek, Janusz1; Koscielski, Marek1; Bukat, Krystyna1; Niedzwiedz, Wojciech2; Jakubowska, Malgorzata2,3; Mlozniak, Anna3
1 Tele and Radio Research Institute, Poland; 2 Warsaw University of Technology, Poland; 3 Institute of Electronic Materials, Poland

D.6 WEEE IN INTERNATIONAL CONTEXT (3)

Session Chair: Chaturvedi, Ashish · GIZ, India

15.30 Regulatory Framework for the Management of Waste Electronic and Electrical Equipment (Waste EEE or e-Waste)
Akwuebu, Ebere1; Obani, Pedi2 · 1 Environmental Law Research Institute, Nigeria; 2 UNESCO-IHE Institute for Water Education, Netherlands
16.00 **Reverse Logistic System of Electronic Waste in Thailand: An Environmental Perspective**  
Monprapussorn, Sathaporn¹; Banomyong, Ruth²  
¹Faculty of Social Sciences, Srinakharinwirot University, Thailand; ²Department of International Business, Logistics and Transport, Thammasat University, Thailand

16.30 **E-Waste in the Brazilian Context**  
Barrera Saavedra, Yovana María¹; Ometto, Aldo Roberto²  
¹Environmental Engineering Sciences, School of Engineering of São Carlos-University of São Paulo, Brazil; ²Department of Production Engineering, School of Engineering of São Carlos-University of São Paulo, Brazil

17.00 **Recycling of Discarded Electronic Products in Institutions in Nigeria**  
Adewumi, Ife Kehinde¹,²,³; Akinwunmi, Olumide²,³; Awoyemi, Musa²,³; Sapre-Obi, Ebipuado¹,³  
¹Niger Delta University, Wilberforce Island, Nigeria; ²Obafemi Awolowo University, Nigeria; ³Greener Environment Management/Support Initiative (GEMS), Nigeria

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**E.6 DATA AND COMPLIANCE MANAGEMENT MANAGEMENT IN THE SUPPLY CHAIN (1)**  
**Room E 15.30 – 17.30**

**Session Chair:** Williams, Eric · Rochester Institute of Technology, Rochester, USA

15.30 **Challenges and Methods for Standardised Legal Compliance Management in the Production of Electronics**  
Stachura, Marek; Stein, Nick; Leitner, Thomas  
KERP Center of Excellence Electronics & Environment GmbH, Austria

16.00 **Practical Experience Implementing BOMcheck – The Philips Case**  
Scheijgrond, Jan-Willem; Onrust, Poppe · Philips, the Netherlands

16.30 **Identifying and Managing Substances of Concern in Electronics**  
Jager, Walter¹; Langton, Joe²; Nørlem, Torben³  
¹Intertek, Canada; ²Intertek, United States of America; ³Intertek, Denmark

17.00 **Implementing Product-Related Hazardous Substances Management by a Reporting-Oriented Project Management Approach**  
Dully, Stefan¹; Schifflteinr, Andreas²  
¹Continental Teves AG & Co. oHG, Germany; ²KERP Kompetenzzentrum, Wien, Austria
A.7  CARBON FOOTPRINT (1)  Room A  8.30–10.00

Session Chair: Schischke, Karsten · Fraunhofer IZM, Berlin, Germany

8.30  Development of a Simplified Carbon Footprinting Methodology for the Semiconductor Industry
Hu, Allen H.1; Huang, Ching-Yao2; Yin, Jessica3; Lin, Pei-Hsuan3
1Consultant, United Microelectronics Corporation (UMC) and National Taipei University of Technology, Taiwan, Republic of China; 2National Taipei University of Technology, Taiwan, Republic of China; 3United Microelectronics Corporation (UMC), Taiwan, Republic of China

9.00  Environmental Product Assessments for Small Computer and Laptop Companies –MicroPro’s Experience with Eco-Design of Product Service Systems
Maher, Paul1; Ospina, Jose Luis1; Schischke, Karsten2; Schloesser, Alexander2
1MicroPro Computers, Ireland; 2Fraunhofer IZM, Berlin, Germany

9.30  Carbon Footprint of a Dell Rack Server
Stutz, Markus1; O’Connell, Scott2; Pflueger, John2
1Dell GmbH, Frankfurt, Germany; 2Dell Inc., Austin, TX, USA

B.7  EOL MODELLING METHODS  Room B  8.30–10.00

Session Chair: Huisman, Jaco · Huisman Recycling Research, Eindhoven, the Netherlands

8.30  A Parallel Disassembly Method for Green Product Design
Smith, Shana; Hung, Pei-Yu · National Taiwan University, Taiwan, Republic of China

9.00  Methodology for Modelling the Eco-Efficiency of Closed-Loop Product Life Cycles
Low, Jonathan Sze Choong1,2; Lu, Wen Feng2; Lee, Hui Mien1
1Singapore Institute of Manufacturing Technology, Singapore; 2National University of Singapore, Singapore
9.30 **The Carbon Footprint of e-Waste Recycling – Indian Scenarios**  
Henzler, Mikael P.; Strasser, Cosima; Eisinger, Frederik; Chaturvedi, Ashish;  
Raghupathy, Lakshmi; Arora, Rachna  
1 adelphi, Germany; 2 Gesellschaft für Internationale Zusammenarbeit (GIZ), India

C.7 **GREEN LIGHTING (1)**  
**Session Chair:** Schoenung, Julie M. · University of California Davis, USA

8.30 **Challenges in LED Packaging and Green Lighting**  
Jordan, Rafael; Hutter, Matthias; Oppermann, Hermann  
Fraunhofer IZM, Berlin, Germany

9.00 **Green Lighting Product Design with a Life Cycle Assessment Approach**  
Su, Daizhong; Casamayor, Jose Luis  
Advanced Design and Manufacturing Engineering Centre, Nottingham Trent University, United Kingdom

9.30 **A Study on Reciprocal Industrial Value Chain and Re-Usable Design of Electronics Devices**  
Kitamura, Masatsugu; Hayashi, Hidetaka · EcoDesign Promotion Network, Japan

D.7 **TAKE-BACK AND RE-USE OF WEEE (1)**  
**Session Chair:** Fitzpatrick, Colin · University of Limerick, Limerick, Ireland

8.30 **Conformity Assessment of WEEE Take-Back Schemes: The Case of Switzerland**  
Boeni, Heinz W.; Kasser, Ueli  
1Empa Materials Science and Technology, Switzerland; 2Büro für Umweltchemie, Switzerland

9.00 **A Study on a Systematic Approach to Manage Used Small Home Appliances**  
Mishima, Nozomu; Mishima, Kuniko  
1Akita University, Japan; 2Keio University, Japan
9.30  
(In-)Formal Collection of e-Waste – The Central Europe Project ‘TransWaste’
Kopacek, Bernd¹; Rothensteiner, Markus¹; Obersteiner, Gudrun²
¹Austrian Society for Systems Engineering and Automation, Austria; ²University of Natural Resources and Applied Life Sciences, Austria

E.7 DATA AND COMPLIANCE MANAGEMENT 
IN THE SUPPLY CHAIN (2) 
Room E
8.30–10.00

Session Chair: Lee, Kun Mo – Ajou University, Suwon, South Korea

8.30  Exchange Regulation-driven Product Declarations Using a New Collaboration-based Approach
Trenner, Torger¹; Feickert, Stefan²; Bachmann, Erik²
¹Weidmüller Interface GmbH & Co. KG, Germany; ²SAP AG, Germany

9.00  Stakeholder Perspectives on Business Model Requirements for a Sustainability Data Exchange Platform Across Supply Chains
Schiffleitner, Andreas¹; Bley, Thomas²; Hornberger, Markus³; Schneider, Ralph³
¹KERP Research GmbH, Austria; ²iPoint-systems GmbH, Germany; ³Fraunhofer IPA, Stuttgart, Germany

9.30  Eco-Efficiency Evaluation as an Important Sustainability Instrument
Melzer, Katrin¹; Walachowicz, Frank¹; Bloch, Wolfgang¹; Saling, Peter²; Kölsch, Peter²; Merz, Christian³; Petermann, Cornelia¹
¹Siemens AG, Germany; ²BASF SE, Germany; ³OSRAM AG, Germany

WEDNESDAY, September 12

A.8 CARBON FOOTPRINT (2) 
Room A
10.30–12.00

Session Chair: Williams, Eric – Rochester Institute of Technology, Rochester, USA

10.30  Towards a Production-Related Carbon Footprint of IT Services (CFIS)
Grimm, Daniel; Erek, Koray; Wilkens, Marc; Zarnekow, Rüdiger
Technische Universität Berlin, Germany
11.00 Neutralize CO₂ Emissions by Product Contributions
Kuwashima, Tetsuya¹; Sekimoto, Kazuhiko²; Kawai, Katsuhiko²; Iida, Yoshihiro¹; Yokoyama, Ryo¹; Takemoto, Masako¹; Fujioka, Yasuyuki¹; Yoshida, Yasuki¹
¹TDK Corporation, Japan; ²TDK-Lambda Corporation, Japan

11.30 Introducing Immediate Carbon Footprint Assessment to Computer Aided Product Design
Chang, Hsiang-Tang; Yang, Yu-Sheng
National Kaohsiung First University of Science and Technology, Taiwan, Republic of China

B.8 DEMATERIALISATION (1)

Session Chair: Pfahl, Robert C. · iNEMI, Herndon, USA

10.30 What Makes a Difference for Environmental Performance of Online Newspapers?
Arushanyan, Yevgeniya; Moberg, Åsa · KTH Royal Institute of Technology, Div. of Environmental Strategies Research and CESC Centre for Sustainable Communications, Sweden

11.00 Electronic Billing vs. Paper Billing: Dematerialization, Energy Consumption and Environmental Impacts
Kim, Junbeum; Rohmer, Serge · CREIDD Research Centre on Environmental Studies & Sustainability, University of Technology of Troyes, France

11.30 Virtualizing Home Gateways for Large Scale Energy Reduction in Networks
Gelas, Jean-Patrick³, ⁴, ⁵; Lefevre, Laurent¹, ³, ⁴; Assefa, Teferi²; Libsie, Mulugeta²
¹INRIA, France; ²University of Addis Abeba, Ethiopia; ³Ecole Normale Superieure de Lyon, France; ⁴University of Lyon, France; ⁵Université Claude Bernard, Lyon, France
C.8 GREEN LIGHTING (2)  

**Session Chair:** Jordan, Rafael · Fraunhofer IZM, Berlin, Germany

10.30 Mass Flows of Selected Target Materials in LED Products  
Marwede, Max¹; Chancerel, Perrine¹; Deubzer, Otmar²; Jordan, Rafael²; Nissen, Nils F.²; Lang, Klaus-Dieter¹,²  
¹Technische Universität Berlin, Germany; ²Fraunhofer IZM, Berlin, Germany

11.00 Comparative Assessment of Potential Environmental Burden and Human Health Impacts of Artificial Illumination Products  
Schoenung, Julie M.¹; Kang, Daniel H.²; Lim, Seong-Rin³; Ogunseitan, Oladele A.²  
¹University of California Davis, United States of America; ²University of California Irvine, United States of America; ³Kangwon National University, South Korea

11.30 Environmental and Health Aspects of Solid State Lighting: An Assessment  
Spengler, Laura; Reihlen, Antonia; Sander, Knut; Jepsen, Dirk; Reintjes, Norbert  
Ökopol GmbH, Germany

D.8 TAKE-BACK AND RE-USE OF WEEE (2)  

**Session Chair:** Schluep, Mathias · Empa, St. Gallen, Switzerland

10.30 Analysis of Lifespan of Mobile Phones: Estimation of EoL Mobile Phones Generation  
Polák, Miloš¹,²; Drápalová, Lenka¹,²  
¹REMA System, Czech Republic; ²Charles University Environment Center, Faculty of Humanities, Czech Republic

11.00 Potential of Reuse to Create Regional Added Value and Employment  
Koch, Martin · Bundesarbeitsgemeinschaft Arbeit e.V., Germany
11.30 **Success Factors and Barriers in Re-use of Electrical and Electronic Equipment**
Kissling, Ramon\(^1\); Fitzpatrick, Colin\(^2\); Boeni, Heinz W.\(^1\); Luepschen, Claudia\(^3\);
Andrew, Stefan\(^4\); Dickenson, John\(^5\)
\(^1\)Empa, Swiss Federal Laboratories for Material Testing and Research, Switzerland; \(^2\)University of Limerick, Ireland; \(^3\)United Nations University, UNU-ISP SCYCLE, Germany; \(^4\)Technical University Braunschweig, Germany; \(^5\)AERCCR, Inc. Americas Take-Back and Compliance Systems, United States of America

**E.8 INTEGRATING SUSTAINABILITY IN SMES**

**Session Chair:** Eagan, Patrick D. · University of Wisconsin-Madison, Madison, USA

10.30 **Life Cycle Thinking in Small and Medium Sized Enterprises – Status Quo and Strategic Needs in the Electronics Sector**
Sherry, Jude\(^1\); Schischke, Karsten\(^2\); O’Rafferty, Simon\(^1\); Nissen, Nils F.\(^2\);
Sitek, Janusz\(^3\); Pamminger, Rainer\(^4\); Wimmer, Wolfgang\(^4\)
\(^1\)Ecodesign Centre, United Kingdom; \(^2\)Fraunhofer IZM, Berlin, Germany; \(^3\)Tele and Radio Research Institute, Warsaw, Poland; \(^4\)Vienna University of Technology, Austria

11.00 **How to Support SMEs in the Sustainable Design of Their Products – The liMaS Project Approach**
Alonso, Juan Carlos\(^1\); Rodrigo, Julio\(^1\); Cañellas, Noemi\(^1\); Chancerel, Perrine\(^2\);
Rückschloss, Jana\(^3\); Schischke, Karsten\(^3\); Campo, Francisco\(^4\); Benito, Gorka\(^4\)
\(^1\)SIMPPLE, Spain; \(^2\)Technische Universität Berlin, Germany; \(^3\)Fraunhofer IZM, Berlin, Germany; \(^4\)IK Ingeniería, Spain

11.30 **Ecodesign Tool for SMEs in the Electronics Sector**
Baumann, Michael\(^1\); Held, Michael\(^1\); Riese, Oliver\(^2\); Steining, Harald\(^3\);
Herrmann, Constantin\(^4\); Saraev, Alexandra\(^4\)
\(^1\)University of Stuttgart, Department Life Cycle Engineering (GaBi), Germany; \(^2\)ries electronic GmbH, Germany; \(^3\)Häusermann GmbH, Germany; \(^4\)PE International AG, Germany
WEDNESDAY, September 12

A.9 DEMATERIALISATION (2)  Room ABC  13.00–14.30

Session Chair: Nissen, Nils F. · Fraunhofer IZM, Berlin, Germany

13.00 Which Environmental Impacts for ICT? – LCA Case Study on Electronic Mail
Farrant, Laura; Le Guern, Yannick · BIO Intelligence Service, France

13.30 Challenges in LCA Comparisons of Multifunctional Electronic Devices
Judl, Jáchym; Mattila, Tuomas; Seppälä, Jyri; Koskela, Sirkka; Kautto, Petrus
Finnish Environment Institute, Finland

14.00 Bill of Attributes Modeling and Life Cycle Assessment: Case Study of Laptop Computers
Williams, Eric¹; Kahhat, Ramzy²
¹Rochester Institute of Technology, Rochester, New York, USA; ²Pontifical Catholic University of Peru, Lima, Peru

D.9 ZERO WASTE IN INDUSTRIAL NETWORKS – ZEROWIN (1)  Room D  13.00–14.30

Session Chair: Kopacek, Bernd · Austrian Society for Systems Engineering and Automation, Vienna, Austria

13.00 Introduction to ZeroWIN and Major Results Already Achieved
Kopacek, Bernd; Schadlbauer, Sabine · Austrian Society for Systems Engineering and Automation, Austria

13.10 The ZeroWIN Production Model
Kopacek, Bernd¹; Schadlbauer, Sabine¹; Arnaiz, Sixto²; Gallo, Maitane²
¹Austrian Society for Systems Engineering and Automation, Austria; ²Fundacion GAIKER, Spain

13.30 D4R Laptop – Industrial Networks and Eco-design to Maximise Re-Use and Eliminate Waste
Maher, Paul¹; Ospina, Jose Luis¹; Hickey, Stewart²; Itziar, Vidorreta³; Yang, Mona⁴
¹MicroPro Computers, Ireland; ²Department of Electronic and Computer Engineering, University of Limerick, Ireland; ³GAIA Cluster of Telecommunications of the Basque County, Spain; ⁴AUO Taiwan, Republic of China
13.50 **Practical Demonstrator ‘Design for Recycling Photovoltaic System’**
Arranz, Pol¹; Tarragó, Joan¹; Vallvé, Xavier¹; Marwede, Max²; den Boer, Emilia³; Rothe, Michael⁴; Wüst, Felix⁴; Middendorf, Andreas²,⁴; Cocciantelli, Jean-Michel⁵; Lippert, Michael⁵
¹Trama TecnoAmbiental, Barcelona, Spain; ²Technische Universität Berlin, Germany; ³Institute of Environment Protection Engineering, Wrocław University of Technology, Wrocław, Poland; ⁴Fraunhofer IZM, Berlin, Germany; ⁵Saft SAS, Bagnolet, France

14.10 **Practical Demonstrator ‘ReUse ICT Network’**
Dietrich, Johannes¹; Becker, Frank¹; Kast, Gerhard²; Nittka, Thomas³; Kopacek, Bernd⁴; Schadlbauer, Sabine⁴; Modoran, Dan⁵; Obersteiner, Gudrun⁶; Scherhaufer, Silvia⁶; Regenfelder, Max⁷
¹Technische Universität Berlin, Germany; ²Umweltanalytische Produkte GmbH, Germany; ³tricom GmbH, Germany; ⁴Austrian Society for Systems Engineering and Automation, Austria; ⁵Greentronics S.R.L., Romania; ⁶University of Natural Resources and Life Sciences, Austria; ⁷Graduate School of Excellence Advanced Manufacturing Engineering, Germany

**E.9 SCENARIOS AND SYSTEM EVALUATION**

**Session Chair:** Müller, Esther · Empa, St. Gallen, Switzerland

13.00 **Describing Sustainability Scenarios of Regional Electricity Systems: Influences of Introducing Photovoltaic Systems and Electric Vehicles into Electricity Networks**
Kurahashi, Naoto; Kishita, Yusuke; Kobayashi, Kazuhiro; Yamaguchi, Yohei; Fukushige, Shinichi; Umeda, Yasushi
Osaka University, Japan

13.30 **A Green-Feature Based LCA Backtracking Mechanism**
Yang, Xiaodong¹; Li, Fangyi¹; Wang, Xiaowei²; Wang, Liming³
¹Shandong University, People’s Republic of China; ²Shandong JianZhu University, People’s Republic of China; ³Concordia University, Canada

14.00 **Early Replacement of Notebooks Considering Environmental Impacts**
Prakash, Siddharth¹; Liu, Ran¹; Schischke, Karsten²; Stobbe, Lutz²
¹Öko-Institut e.V., Germany; ²Fraunhofer IZM, Berlin, Germany
**D.10 ZERO WASTE IN INDUSTRIAL NETWORKS – ZEROWIN (2)**

**Session Chair:** Kopacek, Bernd • Austrian Society for Systems Engineering and Automation, Vienna, Austria

14.30 **Practical Demonstrator ‘Automotive’ – Manufacturing of Security-Relevant Component with Plastic Re-cyclate in Automotive in an Industrial Network**

Regenfelder, Max2; Faller, Jürgen1; Perthes, Harald1; Dully, Stefan1

1Continental Teves AG & Co. oHG, Germany; 2University of Stuttgart, Germany

14.50 **Practical Demonstrator ‘Business to Business’ (B2B) EEE Industrial Networks**

Peagam, Richard1; McIntyre, Kirstie2; Schadlbauer, Sabine3; Aionesei, Cristian4; Dietrich, Johannes5; Arnaiz, Sixto6

1University of Surrey, United Kingdom; 2Hewlett Packard, United Kingdom; 3Austrian Society for Systems Engineering and Automation, Austria; 4Greentronics, Romania; 5Technische Universität Berlin, Germany; 6Gaiker, Spain

15.10 **Bringing all Industrial Networks Together and Next Steps**

den Boer, Emilia1; Williams, Ian2; Fitzpatrick, Colin3; Arranz, Pol4; Dietrich, Johannes5; Kent, Andrew6; Tischer, André7; Durao, Vera8; Perthes, Harald9; Peagam, Richard10; Kopacek, Bernd11

1Wroclaw University of Technology, Poland; 2University of Southampton, United Kingdom; 3University of Limerick, Ireland; 4Trama Tecnico Ambiental, Spain; 5Technische Universität Berlin, Germany; 6Remade South East, United Kingdom; 7bauseve GmbH, Germany; 8CEIFA ambiente, Lda., Portugal; 9Continental, Germany; 10University of Surrey, United Kingdom; 11Austrian Society for Systems Engineering and Automation, Austria

15.30 **Industrial Networking in European Policies and Legislation – Results From the ZeroWIN Project**

Luepschen, Claudia1; O’Connor, Clementine2; Kuehr, Ruediger1; Hestin, Mathieu2; Mudgal, Shailendra2; Charter, Martin3; den Boer, Emilia4; Gornikowski, Wojciech5; Kopacek, Bernd6; Schadlbauer, Sabine6; Woolman, Tim3; Yang, Mona7; den Boer, Jan5

1United Nations University (UNU-ISP SCYCLE), Germany; 2Bio Intelligence Services, France; 3The Centre for Sustainable Design, University for the Creative Arts, UK; 4Wroclaw University of Technology, Poland; 5WAAMCO, Poland; 6Austrian Society for Systems Engineering and Automation, Austria; 7AUO, Taiwan, Republic of China
“FOUR LEGS GOOD, TWO LEGS BAAA-D!”

The pigs’ famous slogan from George Orwell’s allegorical Animal Farm has become shorthand for oversimplified approaches and manipulating answers to difficult questions. The sheep were happy to take up the slogan and to repeat it at all opportunities paving the way for the pigs’ reign on the farm.

How often in your professional and private life do you follow such simplifications and act like the sheep do? How often do you simply adopt opinions from authorities, or from people and institutions that try to manipulate you? How many environmental and other convictions are based on the same principles? “Renewable materials good, plastics bad!” “Returnable bottles good, non-returnables baaa-d!!”

Often, the reality is more complex, or even the very opposite of the reigning doctrine! For example, in 2008, experts at the Provoquium explained why sustainable development actually requires the use of toxic metals and demonstrated how sustainability in industry in fact hinders environmental progress.

Confused? Well, you’ll have to attend the Provoquium to find out whether the expert panel is trying to pull your leg, playing devil’s advocate, or raising serious questions that just don’t have black-and-white answers.

The Provoquium will challenge commonly held convictions on environmental issues and encourage you to come up with better and more nuanced solutions by taking a fresh look at today’s burning issues. In short 5 minute statements, the speakers will “brain-shake” traditional thinking about the environment and related scientific and social developments.

Join the Provoquium if you like controversial discussion and thinking outside of the box at fast pace, science slam-style. You won’t get to vote in the Provoquium, but we do look forward to your active participation.

By the way, the Animal Farm pigs claimed the opposite to be true in the end: “Four legs good, two legs better!”

“Baaa!”

Please note: The presentations do not necessarily represent the opinion of the speakers or the speakers’ organization!
Closing Keynotes

Wednesday, September 12

Closing Keynotes

Session Chair: Nissen, Nils F. · Fraunhofer IZM, Berlin, Germany

16.00 Path to Sustainability:
A Perspective on the Opportunities and Need for Collaboration
Scott O’Connell · Dell, USA

16.30 Closing Notes
Nils F. Nissen · Fraunhofer IZM, Berlin, Germany
Andreas Middendorf · Technische Universität Berlin, Germany
Klaus-Dieter Lang · Fraunhofer IZM, Berlin, Germany; Technische Universität Berlin, Germany
Participants will have easy access to the posters throughout the conference, as the poster session will be held in the Dahlem Cube’s lobby, next to the exhibition area. The poster authors will be present during the lunch breaks to explain their posters and answer any questions.

**Main Presentation Slots**
- Monday, 10 Sept., 12.15 – 13.30 (press walkabout)
- Tuesday, 11 Sept., 12.30 – 13.30
- Wednesday, 12 Sept., 12.00 – 13.00

We ask all poster presenters to bring the printed poster (DIN A0 841 x 1189 mm portrait style) to the conference. Means of fixing the posters will be provided by the organizers, and there will be someone to assist you with the hanging. Posters should hang before 12.00 on Monday, September 10, 2012. If you want to keep your poster, please take it with you at the end of the conference or arrange shipping. All posters that are still there Wednesday evening will be thrown away.
P.01 Moving toward Sustainable IT – Including CSR in the TCO Certified Sustainability Certification
Hobby, Clare; Rydell, Niclas; Enholm, Soren; Blomgren, Gabriella; Fuller, Stephen; Nolte, Emma · TCO Development, Sweden

P.02 From Green IT to Sustainable Electronics
Rifer, Wayne; Brody-Heine, Pamela · Green Electronics Council, United States of America

P.03 LCA for Green System Design of Digital Media
Schien, Daniel1; Preist, Chris1; Yearworth, Mike1; Shabajee, Paul1; Wood, Steven G.2
1 University of Bristol, United Kingdom; 2 University of Surrey, United Kingdom

P.04 Process Modeling for Green IT Service Management
Pauwels, Dirk1, 2; Cattrysse, Dirk2; Duflox, Joost R.2; Mulder, Hans3
1 Fujitsu Technology Solutions, Brussels, Belgium; 2 Katholieke Universiteit Leuven, Leuven, Belgium; 3 Antwerp Management School, Antwerp, Belgium

P.05 Eco-design and Innovation on IT Services: A Business Look
Teulon, Helene1; Durieux, Xavier2 · 1 Gingko 21, France; 2 Orange Business Services, France

P.06 Development of a Tool for Simplified Life Cycle Assessment and Ecodesign of Electrical and Electronic Products
Orgelet, Julie; Fabre, Yann; Quesne, Agnes · Bureau Veritas CODDE, France

P.07 Optimal Depth of Industrial Products’ Disassembly
Achillas, Charisios1, 2; Aidonis, Dimitris3; Karagiannidis, Avraam2; Mousiopoulos, Nicolas2; Loulos, Vasilios2
1 International Hellenic University, Greece; 2 Aristotle University Thessaloniki, Greece; 3 Alexander Technological Educational Institute, Greece

P.08 A Life Cycle Design Method Based on Green Features
Xin, Lanlan1; Li, Fangyi1; Wang, Xiaowei2; Wang, Liming3
1 Shandong University, People’s Republic of China; 2 Shandong Jianzhu University, People’s Republic of China; 3 Concordia University, Canada

P.09 Sustainable, Reliable and Cost-Effective Solutions in Plastic Components for Electric and Electronic Industry
Nerone, Antonio · Dupont International SA, Switzerland
Approach for Assessing Sustainability in Industrial Networks Based on the ZeroWIN Project
Scherhauner, Silvia; Saraev, Alexandra; Pertl, Andreas; Beigl, Peter; Obersteiner, Gudrun
1 Institute of Waste Management, BOKU University of Natural Resources and Life Sciences, Vienna, Austria; 2 PE INTERNATIONAL AG, Stuttgart, Germany

Leverage Smart System Services Technology for Smart Green Building Management
Wang, Ko-Yang; Lin, Grace; Chou, Paul; Chou, Anthony
Institute for Information Industry, Taiwan, Republic of China

Rapid Analysis of Organic Compounds Regulated by REACH Regulation Using Ion Attachment Mass Spectrometry
Oki, Mitsuhiro; Takenaka, Miyuki
Toshiba Corporation, Japan

Constructing Toxic Potential Indicator (TPI) for Mixture Material
Chen, Jahau Lewis; Ju, Jian-Hung; Yen, Sheng-Bou Yen
1 National Cheng Kung University, Taiwan, Republic of China; 2 Chia Nan University of Pharmacy & Science, Taiwan, Republic of China

REACH and RoHS Compliance in the Supply Chain
Hink, Eva Susanne; Lückefett, Hans-Jochen
K & L GmbH, Germany

Data Management Concerning Hazardous Substances
Dully, Stefan; Regenfelder, Max
1 Continental Teves AG & Co. oHG, Germany; 2 University of Stuttgart, Germany

Realizing Sustainability Strategies Efficiently – Which Processes Should be Optimized First?
Hill, Martin; Oberbacher, Tonda Rolf
SAP Deutschland AG & Co. KG – Sustainability EMEA, Germany

Resource Efficiency vs. Competition: In 2020, would Resource-efficient Europe be more Competitive than Non-resource Efficient China?
Park, DaeYoung
Young & Global Partners, Ghent University, Belgium
P.18  **Paths to Improving the Environmental Performance of Lithium-ion Batteries: From Eco-design to Eco-innovation**
Mogensen, Anna1; Rousse, Gwenaelle2
1 PanOrder Eco-Consulting, Germany; 2 Institut de Minéralogie et de Physique des Milieux Condensés, Université Pierre et Marie, France

P.19  **Reducing Energy Consumption in ICT by Implementing Dynamic Bus Voltage Architecture**
Le Fevre, Patrick · Ericsson AB, Sweden

P.20  **Proton Beam Writer (PBW) for Novel Processing Tool to Increase Surface Utility of Flexible Printed Circuits**
Hayashi, Hidetaka1,2; Nishikawa, Hiroyuki2
1 EcoDesign Promotion Network, Japan; 2 Shibaura Institute of Technology, Japan

P.21  **Hybrid Bonding of Organic/Inorganic Substrates in Ambient Air for Eco-friendly 3D Integration of Microelectronics**
Shigetou, Akitsu1; Suga, Tadatomo2
1 National Institute for Materials Science, Japan; 2 The University of Tokyo, Japan

P.22  **New Approaches for Component Recycling of Crystalline Solar Modules**
Nieand, Sabine1; Pfaff, Tino1; Neuhaus, Uta1; Rädlein, Edda2
1 CiS Forschungsinstitut für Mikrosensorik und Photovoltaik GmbH, Erfurt, Germany; 2 Technical University of Ilmenau, Germany

P.23  **Collective Implantement of the Take-back and Recycling Obligation for End-of-Life PV Panels: Experience of the European System**
Gomez, Virginia; Clyncke, Jan; Lange, Alina · PV CYCLE, Belgium

P.24  **Life Cycle Resource Consumption and Land Use of Photovoltaic (PV) System in South Korea**
Kim, Junbeum1; Lim, Jiho2; Kim, Youngwoon2
1 CREIDD Research Centre on Environmental Studies & Sustainability, University of Technology of Troyes, France; 2 Inha University, South Korea

P.25  **Recycling Options for LEDs and LED Products**
Bergamos, Maik, Höltig, Rolf · ELPRO Elektronik-Produkt Recycling GmbH, Brunswick, Germany
P.26 **Methodology to Identify Design for Recycling Measures for High-Tech Sectors**

Marwede, Max¹; Schischke, Karsten²; Arranz, Pol³; Hickey, Stewart⁴; Fitzpatrick, Colin⁴; Ospina, Jose Luis⁵; Yang, Mona⁶; Nissen, Nils F.²; Lang, Klaus-Dieter¹.²

¹ Technische Universität Berlin, Germany; ² Fraunhofer IZM, Berlin, Germany; ³ Trama Tecno Ambiental, Spain; ⁴ University of Limerick, Ireland; ⁵ MicroPro Computers, Ireland; ⁶ AUO, Taiwan, Republic of China

P.27 **Green Procedure for the Selective Recovery of Precious, Specialty, and Toxic Metals from Electronic Wastes**

Izatt, Neil; Izatt, Steven; Bruening, Ronald

IBC Advanced Technologies, Inc., United States of America

P.28 **Closed Loop Recycling of Plastic Housing for Flat Screen TVs**

Peeters, Jef R.¹; Vanegas, Paul¹.²; Devoldere, Tom³; Dewulf, Wim¹.⁴; Duflou, Joost R.¹

¹ KULeuven, Belgium; ² Universidad de Cuenca, Cuenca, Ecuador; ³ TP Vision, Bruges, Belgium; ⁴ Group T-International University College Leuven, K.U.Leuven Association, Belgium

P.29 **MoveRec: Online Tool for Estimating the Material Composition of WEEE Input Streams**

Dos Santos, Maria Noel¹; Spitzbart, Markus²; Weinlich, Michael¹;
Leitner, Thomas¹; Laner, David³; Cencic, Oliver³; Rechberger, Helmut³

¹ KERP Research Electronic & Environment GmbH, Austria; ² Wiener Volkshochschulen GmbH/D.R.Z, Austria; ³ Technische Universität Wien, Austria

P.30 **Electronic Waste Management in India: Status and Challenges to Overcome**

Yadav, Vikram Singh - Gautam Budha Technical University, India

P.32 **Growing Regulatory Complexity as Challenge – Strategies for Managing Compliance with International Waste Regulations**

Brandmann, Christina; Altvater, Meike - 1WEEE Services GmbH, Germany
Located directly in the conference area of the Dahlem Cube, the exhibition hall assumes the function of a village market: it will be the center of communication, theater for the presentation of new ideas and catering.

**ENVIRON**

ENVIRON provides Integrated Product Compliance services which enable companies to outsource the management of their WEEE, batteries and packaging producer registration, recycling and reporting requirements to ENVIRON in all 27 EU Member States (see www.b2bweee.com for details). ENVIRON manages the www.bomcheck.net substances declarations web database system which over 450 companies are using to gather compliance data from over 2,500 suppliers for RoHS, REACH and other product regulations around the world.

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Fraunhofer IZM – Creative Minds for Smart Electronics
Fraunhofer IZM provides its customers with tailor-made system integration technologies on wafer, chip and board level. Its research also ensures that electronic systems are more reliable, so that it can accurately predict life-cycle. The department Environmental & Reliability Engineering also focuses on the following topics:
- Technologies for green electronics
- Environmental assessment and eco-design
- Environmental legislation (RoHS, WEEE, EuP/ErP)

Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration IZM
Gustav-Meyer-Allee 25
13355 Berlin, Germany
www.izm.fraunhofer.de

IEEE Components, Packaging and Manufacturing Technology Society CPMT
IEEE is the world’s largest professional association dedicated to advancing technological innovation and excellence for the benefit of humanity. IEEE and its members inspire a global community through IEEE’s highly cited publications, conferences, technology standards, and professional and educational activities. The CPMT society is a technical co-sponsor of the conference.

IEEE Components, Packaging and Manufacturing Technology Society
445 Hoes Lane
Piscataway, NJ 08854-4141 USA
http://cpmt.ieee.org/

iNEMI – International Electronics Manufacturing Initiative
The International Electronics Manufacturing Initiative (iNEMI) is a not-for-profit, global R&D consortium. Members include leading electronics manufacturers, suppliers, associations & universities. iNEMI roadmaps the future technology requirements of the global electronics industry to identify & prioritize technology & infrastructure gaps. iNEMI conducts high-impact deployment projects that support our members’ businesses by accelerating deployment of new technologies & industry infrastructure, stimulating standards development & disseminating efficient business practices.

iNEMI – International Electronics Manufacturing Initiative
2214 Rock Hill Road, Suite 110, Herndon, VA 20170-4214, USA
www.iNEMI.org
Exhibitors at EGG2012+

**IT2Green – Energy-efficient Information and Communication Technology**

The IT2Green funding programme was launched by the German Federal Ministry of Economics and Technology in response to the rise in electricity consumption for ICT, as more and more people are making intensive use of computers, mobile telephones, internet-based services and high-definition video and television. Within IT2Green, ten projects are working to develop energy-efficient solutions in the areas ‘telecommunications networks’, ‘computer centres and clouds’ and ‘monitoring and management’.

**IT2Green Begleitforschung, c/o VDI/VDE Innovation + Technik GmbH**
Steinplatz 1
10623 Berlin, Germany
it2green@vdivde-it.de
http://www.vdivde-it.de

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**PE INTERNATIONAL AG**

PE INTERNATIONAL is one of the world’s most experienced sustainability software, content and strategic consulting firms. With 20 years of experience and 20 offices around the globe, PE allows clients to understand sustainability, improve their performance and succeed in the marketplace. Through market leading software solutions, consulting services and implementation methodologies PE has worked with some of the world’s most respected firms to develop the strategies, management systems, tools and processes needed to achieve leadership in sustainability.

**PE INTERNATIONAL AG**
Hauptstraße 111-113
70771 Leinfelden-Echterdingen, Germany
www.pe-international.com

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**PINFA – Phosphorus, Inorganic and Nitrogen Flame Retardants Association**

pinfa, the Phosphorus, Inorganic & Nitrogen Flame Retardants Association represents the manufacturers and users of the three major technologies of non-halogenated flame retardants. The members of pinfa share the common vision of continuously improving the environmental and health profile of their flame retardant products and offering innovative solutions for sustainable fire safety. pinfa engages in a dialogue with the users of flame retardants on the development of environmentally-friendly fire safety solutions.

**PINFA – Phosphorus, Inorganic and Nitrogen Flame Retardants Association, Cefic – European Chemical Industry Council**
Avenue E. Van Nieuwenhuyse, 4 - Bte 1
B-1160 Bruxelles, Belgium
www.pinfa.eu
Exhibitors at EGG2012+

SAP

As market leader in enterprise application software, SAP (NYSE: SAP) helps companies of all sizes and industries run better. From back office to boardroom, warehouse to storefront, desktop to mobile device – SAP empowers people and organizations to work together more efficiently and use business insight more effectively to stay ahead of the competition. SAP applications and services enable customers to operate profitably, adapt continuously, and grow sustainably.

SAP AG
Dietmar-Hopp-Allee 16
69190 Walldorf, Germany
www.sap.com

SGS

SGS is the world’s leading inspection, verification, testing and certification company. Recognised as the global benchmark for quality and integrity, we employ more than 70 000 people and operate over 1 350 offices and laboratories around the world. Across SGS global network, our environmental experts support companies in their sustainable development strategy by helping analyze the life cycle of consumer goods, design more environmental-friendly products and promote related performance.

SGS S.A.
1 Place des Alpes, P.O. Box 2152
Geneva 1, 1211, Switzerland
www.sgs.com

Collaborative Research Center (CRC) 1026 – Sustainable Manufacturing

Sustainability has become an urgent requirement and challenge for mankind’s survival on earth with respect to the limits of resources and growth and the unequal distribution of wealth. CRC 1026, which is sponsored by the German Science Foundation (DFG), intends to demonstrate how sustainable manufacturing embedded in global value creation proves to be superior to traditional paradigms of management and technology.

CRC – Collaborative Research Centre „Sustainable Manufacturing“, c/o Technische Universität Berlin, IWF, PTZ 2
Pascalstraße 8–9
10587 Berlin, Germany
www.sustainable-manufacturing.net/

Young & Global Partners

Young & Global Partners are the foremost provider of country-specific and industry-specific EHS regulatory analysis with country experts and partners in over 35 countries. Our mission is to provide clients with authoritative regulatory analysis and insights to make not only risk-manageable decisions but proactive and strategic decisions. We offer:

- Country EHS regulatory analysis for over 120 countries
- Industry-specific EHS regulatory analysis
- Latest risk management strategies and best practices.

Young & Global Partners SPRL
101 Avenue Louise
1050 Brussels, Belgium
www.ynpglobal.com
SUNDAY, September 9

GET TOGETHER  

A welcome reception will be held on Sunday at 6.30 pm for all already arrived conference participants and forum & tutorial participants. Join us in the hotel restaurant or, weather permitting, the hotel’s courtyard, for a BBQ and meet-and-greet. It’s a great chance to make a head start on getting to know your fellow delegates.

STEP CELEBRATION
This year, the Electronics Goes Green 2012+ Get-Together will be celebrating the 5th anniversary of the StEP initiative – Solving the E-waste Problem. Let’s get together to congratulate them!

MONDAY, September 10

EGG2012+ WELCOME RECEPTION  

Monday’s gala dinner promises to be a spectacular evening, with the “New Glass House” in Berlin’s historic Botanic Gardens as this year’s venue. If the weather allows, we will take the short 15 minute stroll together from the Dahlem Cube to the glass house, but courtesy buses will also be available for both legs of the trip.

At the Reception, the „Electronics Goes Green 2012+ Award“ will be presented to
- Paul Maher, MicroPro, Ireland;
- Wayne Rifer, Green Electronics Council, USA;
- Charuek Hengrasmee, Electrical and Electronics Institute, Thailand

for their commitment to environmental protection and their inspiring ideas on sustainable development in technology and business solutions.

The evening will be opened by the Vice President of the Technical University of Berlin, Dr. Gabriele Wendorf.

Please note additional information for this event on the next page.
WELCOME RECEPTION
Entry only via the Botanical Garden entrance, Königin-Luise-Platz, 14195 Berlin.
Doors open at 6.15 pm.
A number of conference organizers will be on hand to guide you to the venue starting at the Dahlem Cube between 6.15 and 6.45 pm. Shuttle buses will also run between the front of the Dahlem Cube and the entrance of the Botanical Gardens during this time and after the reception.

Attention: please bring your conference badge as your ticket to the reception!

TUESDAY, September 11

BOAT TOUR
„POTSDAM BY NIGHT“

On Tuesday night, we’ll be taking a journey to the Prussia of yesteryear with a boat cruise along Potsdam’s astonishing network of rivers and lakes. A buffet with Berlin specialties awaits the guests aboard. Don’t miss this opportunity to mingle and network with conference attendees from all over the world!
The shuttle service starts from the Dahlem Cube between 5.30 – 6.00 pm. Please note: The last bus departs at 6.00 pm, only 30 minutes after the close of the final session at 5.30 pm. Please ensure that you are on time, as the boat cannot be reached by other means of transport.
Starting Point Boat Cruise: Wannsee pier at Ronnebypromenade (in front of S-Bahnhof Wannsee). Boarding between 6.15 and 6.30 pm.

Attention: please bring your conference badge to the boat trip as your ticket!
Muharrem Batman is well known in the multi-cultural social hotspot Neukölln, a district of Berlin. In his shop, Batman Elektronik, the Turkish-born computer lover buys, sells and repairs IT and consumer electronics. And fifteen years ago he started using materials and components from old electronics to make art. In the course of time, his pieces of art became famous and got invited to exhibitions and fair trades.

Resources become scarce – materials have value and need to be recycled. Muharrem Batman decided to address these facts with a personal perspective combining waste and creativity. All of us use electrical and electronic equipment, and dispose of devices: old notebooks, mobile phones, defect keyboards, graphic cards, modems, cables and so on – after a long time of service, they give up the ghost. And at this point, Muharrem Batman gives these materials a new spirit: In cooperation with his sister, Ayse Batman, and Judith Brun, who make his ideas a reality, he makes sculptures and even dresses out of electronic waste. Already as a child, Muharrem Batman had ideas and dreams that he was not able to realize on his own. Fifteen years ago, he asked his sister for help. What first was meant to be decoration for the shop window now became a new art form.
Sometimes, he combines other materials with electronic, supported by his friends Kemal Cantürk and Steven Studinski, two metal artists, and Ernst Richter, a designer of printed circuit boards and artist.

In the last four years, Muharrem Batman has been using his artistic installations for education. End-of-life electronics should not be careless thrown away: it is precious resources!

There are no boundaries to creativity. If someone says that he is normal, Muharrem Batman is offended. Being creative and crazy is much more fun!

Contact data:
www.elektroschrottkunst.de
Muharrem Batman
Hermannstr. 47, 12049 Berlin
email: m.batman@berlin.de
phone: +49 30 69519101

heads and sculptures: Muharrem & Ayse Batman
(www.elektroschrottkunst.de)
dress and jewelry: Judith Brun
metal art: Kemal Cantürk & Steven Studinski
(www.treptopolis.de)
photography: Ernst Richter
(www.richterlayout.de)
During the conference the EGG 2012 Office can be reached at the conference hotel.

Opening hours will be
Sunday, Sept. 9: 10:00 – 20:00
Monday, Sept. 10: 07:30 – 18:30
Tuesday, Sept. 11: 08:00 – 18:00
Wednesday, Sept. 12: 08:00 – 17:00

Conference Office phone: +49 30 557797-475
Counter & Registration at Ground Level phone: +49 30 557797-484
fax: +49 30 557797-476

CONFERENCE VENUE
The EGG 2012 Conference will be held at the Dahlem Cube Seminaris Hotel, close to the heart of the city. The conference center in the shape of a glass cube is a masterpiece of modern architecture by Helmut Jahn, Chicago. It is situated in the southwest of Berlin, in the district of Dahlem.

THE DAHLEM CUBE – SEMINARIS CAMPUS HOTEL BERLIN
Takustraße 39
14195 Berlin, Germany
Phone: +49 30 557797-0
Fax: +49 30 557797-100
www.seminaris.de

Hotel check-in: from 15:00
Hotel check-out: till 11:00
Practical Information

INTERNET ACCESS
The Seminaris Hotel is kindly providing all conference delegates with wireless Internet access throughout the conference from September 09, 8 am to September 12, 8 pm:

- WLAN Network: SCB
- User name: egg
- Password: egg

Please remember to log out when not using the Internet in order to avoid jammed lines. If your browser blocks pop-up windows, please use the link http://1.1.1.1/logout to log out.

LUNCH AND COFFEE BREAKS
Coffee breaks will be situated in the poster and exhibition area on the ground floor. Lunch will be served in the exhibition hall and additionally in the Seminaris Restaurant.

CONFERENCE PROCEEDINGS
The official language of all presentations is English. The Conference Package will be handed out at the registration desk upon check-in and includes editable electronic copies of the proceedings and the abstract reader. Most of the full papers will be available in the IEEE Xplore Digital Library after the Conference. Late full papers which were not included in the proceedings will be available after the conference at www.egg2012.de/papers.html

TECHNICAL EQUIPMENT FOR PRESENTATIONS
Using personal laptops for presentations is not possible. Speakers are asked to bring a USB stick with their presentation to the session room during the break directly prior to their session, so that the technical support staff can copy the file onto the presentation laptop.

For the technical details of the conference laptops please see www.egg2012.de/presentations.html
CONFERENCE EVALUATION
Please note that the conference package includes the evaluation questionnaire, more copies of which are also available from the conference counter. We encourage participants to share their assessment and ideas for future EGG conferences. Completed questionnaires can be handed in at the conference counter at any time.

CONFERENCE REGISTRATION
The conference registration fee includes admission to all conference sessions, the poster sessions, the exhibition and all evening events. The conference package includes an electronic copy of the proceedings, a list of registered conference participants and authors, lunch and refreshments during breaks.

PAYMENT AND CANCELLATION
EC, Visa, Mastercard, and Amex are accepted for card payments at reception. The registration fee must be credited to the conference account no later than September 6, 2012. Cancellation received in writing before August 1 will be subject to an administration charge of 80€. No refund will be issued after August 1.
Going Green Initiative

CARE INNOVATION, EUROPE
CARE Electronics (Comprehensive Approach for the Recycling and Eco-efficiency of Electronics) is a strategic initiative to understand the implications of sustainability for the electronics industry in the future. For over 14 years, the Symposium Going Green – CARE INNOVATION has been a platform for presenting the up-to-date progress on sustainable development and the development of eco-efficient electronic and automotive products. CARE INNOVATION is the European sister conference to Electronics Goes Green, following a four year cycle with conferences in the even years between Electronics Goes Green.

ECODESIGN, JAPAN
The EcoDesign Symposium on Environmentally Conscious Design and Inverse Manufacturing in Electronics is a periodic national and international meeting in Japan. It has been held since 1999, mostly in Tokyo, but also in Sapporo, last year in Kyoto and next year as a novelty in Korea. EcoDesign reflects not only the status of green electronics products and manufacturing in Japan. It is a symposium that encourages initiatives on a global base, and features application fields beyond electronics. Under the Going Green Initiative, the EcoDesign symposium is an international venue in English language in odd years and a regional Asian conference in even years.

IEEE ISSST, USA
The IEEE International Symposium on Sustainable Systems and Technology is a yearly event covering sustainability in the broader engineering field. Due to its history the conference has strong roots in the electronics community, but at the same time includes other product segments and engineering ethics. Its predecessor the International Symposium on Electronics and the Environment (ISEE) has been held annually since 1993. It was the first regular international event on the topic.
The organizers express their thanks to the following companies and institutions for their assistance: