ICT4S Steering Committee

Dr. Bernard Aebischer, Zurich, Switzerland, Honorary Chair
Prof. Lorenz M. Hilty, Informatics and Sustainability Research (ISR) Group, Department of Informatics, University of Zurich, Switzerland, Chair
Prof. Göran Andersson, Energy Science Center, ETH Zurich, Switzerland
Prof. Thomas F. Rutherford, University of Wisconsin, USA
Prof. Elaine M. Huang, Zurich People and Computing (ZPAC) Lab, Department of Informatics, University of Zurich, Switzerland

Local Organisation

Dr. Wolfgang Lohmann, Technology and Society Lab, Swiss Federal Laboratories for Materials Science and Technology, Empa, Chair
Martina Huber MSc., Informatics and Sustainability Research (ISR) Group, Department of Informatics, University of Zurich, PhD Students’ Workshop
Patrizia Huber, University of Zurich
Miriam Plichta, Department of Informatics, University of Zurich

All participants are invited to the Reception on Friday, 18:00, kindly sponsored by the City and the Canton of Zurich.

Contact
ict4s@ifi.uzh.ch
Tel. +41 44 635 4331 (Miriam Plichta, University of Zurich)
Fax +41 44 635 68 09
Tel. +41 76 539 86 66 (ICT4S Reception Desk, active Feb 13 – Feb 16, 2013)

Further Information about ICT4S 2013 can be accessed at http://www.ict4s.org

Final Program
First International Conference on Information and Communication Technologies for Sustainability
ETH Zurich, February 14-16, 2013

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### THURSDAY FEBRUARY 14

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<th>Time</th>
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<td>08:00-09:00</td>
<td>Welcome Coffee, Registration Desk Open 08:00-18:30</td>
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<tr>
<td>09:00-10:10</td>
<td><strong>P1: Opening Session</strong> Room E7</td>
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<td>10:10-10:40</td>
<td>Coffee Break</td>
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<tr>
<td>10:40-12:40</td>
<td><strong>P2: Background</strong> Room E7</td>
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<td>12:40-14:00</td>
<td>Lunch and Poster Session (13:00-14:00)</td>
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<td>14:00-16:00</td>
<td><strong>A1: ICT Hardware - Energy</strong> Room E7</td>
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<td><strong>B1: Smart Resource Management</strong> Room D7.1</td>
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<td>16:00-16:30</td>
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<td>16:30-18:30</td>
<td><strong>A2: ICT Hardware - Materials</strong> Room E7</td>
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<td><strong>B2: Smart Buildings and Cities</strong> Room D7.1</td>
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<td>18:45</td>
<td>Conference Dinner / Banquet <em>(Voucher needed)</em> ETH Dozentenfoyer</td>
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### FRIDAY FEBRUARY 15

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<td>09:00-10:30</td>
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<td>10:30-11:00</td>
<td>Coffee Break</td>
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<td>11:00-13:00</td>
<td><strong>A3: Smart Energy Solutions</strong> Room E7</td>
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<td><strong>B3: Societal Aspects</strong> Room D7.1</td>
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<td>13:00-14:00</td>
<td>Lunch</td>
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<td>14:00-16:00</td>
<td><strong>A4: ICT Software - Energy</strong> Room E7</td>
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<td><strong>B4: Smart Decisions</strong> Room D7.1</td>
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<td>16:00-16:30</td>
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<td>16:30-18:00</td>
<td><strong>P4: Panel Discussion</strong> Room E7</td>
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<td>18:00-23:00</td>
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<td>• Reception – Drinks and Snacks, Foyer E-Süd</td>
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**SATURDAY FEBRUARY 16**

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<td>08:00-09:00</td>
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<td><strong>Workshop A:</strong> Sustainability, Social Accountability and Computing by IFIP TC9</td>
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<td><strong>Workshop B:</strong> PhD Students’ Workshop by University of Zurich, Department of Informatics</td>
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<td><strong>Workshop C:</strong> Swiss Workshop by BAKOM and ARE</td>
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<td><strong>Language:</strong> German</td>
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Please note that the Workshops on Saturday may have **individual breaks** for coffee and lunch within the time windows given above.

**Proceedings**

The output of this conference will be published in electronic form only. The proceedings will not be printed nor handed out on external storage media at the conference because we are trying to dematerialize this event as much as possible. Advance proceedings are available to the participants via: [https://files.ifi.uzh.ch/ICT4S/](https://files.ifi.uzh.ch/ICT4S/)

In case you need support in accessing the proceedings, please ask our staff at the reception desk.

The final proceedings will be published soon in the E-Collection, the institutional repository of ETH Zurich for open access publishing, with the DOI: [http://dx.doi.org/10.3929/ethz-a-007337628](http://dx.doi.org/10.3929/ethz-a-007337628)
Welcome!

Welcome to the First International Conference on ICT for Sustainability, ICT4S 2013, in Zurich, Switzerland. The contributions announced in this program share one vision: the idea of an information society that is able to make sustainable use of limited natural resources.

Information and Communication Technologies (ICTs) are connected to issues of sustainability in many ways. First, although creating virtual worlds, these technologies are dependent on the supply of energy and scarce materials. Second, ICTs are enabling technologies with the potential to increase the energy and material efficiency of key processes of production and consumption. Depending on the socio-economic framework, they could support the decoupling of value creation from resource use instead of accelerating resource depletion. Third, the computational models we can design and implement with ICT contribute to our understanding of complex systems and support the thoughtful assessment of potential solutions to urgent problems, among them climate change. Many ICT applications create awareness for the challenges we have to face on the way to sustainable development: sustainable use of energy and materials and, at the same time, quality of life for all.

The contributions to ICT4S 2013 are clustered around three groups of questions (the color coding is used throughout this booklet):

1. Sustainability in ICT:
How can we provide ICT services with a minimum amount of energy and material input? How can production and recycling of ICT hardware become sustainable material flow systems? What is sustainable ICT design and operation? These questions are addressed in the following sessions:

- Session A1: ICT Hardware – Energy (Thursday)
- Session A2: ICT Hardware – Materials (Thursday)
- Session A4: ICT Software – Energy (Friday)
2. Sustainability through/by ICT:

How can we create and apply ICT products and services that contribute to the sustainability of production and consumption processes and structures? This question is addressed in the following sessions:

- Session B1: Smart Resource Management (Thursday)
- Session B2: Smart Buildings and Cities (Thursday)
- Session A3: Smart Energy Solutions (Friday)
- Session B4: Smart Decisions (Friday)

3. Societal aspects, economic and political dimensions:

What political and economic framework is necessary to transform the potential of ICTs into sustainable development? How do technological artifacts and social structures and processes interact? How can we model and assess the sustainability of ICT projects and products? These questions are addressed in the following sessions and workshops:

- Session B3: Societal Aspects (Friday)
- Workshop A: Sustainability, Social Accountability and Computing (Saturday)
- Workshop C: Swiss Workshop (Language: German, Saturday)

Overarching aspects will be addressed by invited plenary speakers in sessions P1-P4 who will share their ideas and perspectives on ICT for Sustainability with you – views from research and industry, insights from the past and visions of the future.

The PhD Workshop (Workshop B) will provide PhD students with the unique opportunity to extend their network and to get feedback from senior researchers.

This conference has been organised on the initiative of Dr. Bernard Aebischer, who recently retired from ETH Zurich. It is his pioneering work on ICT and energy that paved the ground for this event. I also want to thank our numerous partners and sponsors (see next page) who made it possible to realize ICT4S.

I am wishing you a successful ICT4S conference, inspiring discussions and a pleasant stay in Zurich!

Prof. Dr. Lorenz M. Hilty
General Chair ICT4S
**Peter Woodward, Conference Facilitator**

One goal of the ICT4S conference is to formulate a set of stakeholder recommendations derived from the research presented. A draft of these recommendations has already been prepared before the conference. Peter will help the participants to further develop the recommendations by bringing in their own views, discussing ‘wicked issues’ and developing a consensus.

Peter Woodward has earned a reputation as a leading independent facilitator. Peter trained in urban and regional planning. He has always focused on aspects of the sustainable development agenda. He gained valuable insights and experience working both for campaigning organisations and a major oil company. In 1995 he was co-founder of Quest Associates, based in the UK.

Peter is in demand across Europe. He works with clients to design and run effective events on themes including climate change, construction, resource efficiency, transport, water security, ICT. Processes range from a visioning exercise with a group of senior executives through to major international conferences.

Peter believes the key to effective progress is in enabling participants to own the issues and work together to achieve powerful outcomes. His drive, humour and skill as a facilitator all contribute to unlocking the very best from people in all situations.

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**Vegetarian Meals**

The local organising team and the conference chairs have decided to exclusively provide vegetarian food during the ICT4S conference. We hope that you will enjoy the lunch meals and dinners without meat and fish. Otherwise, you will find a wide range of services and catering facilities in the vicinity of the ETH building, including the cafeterias of ETH and the University of Zurich nearby.

By providing vegetarian food, this conference is promoting a relevant aspect of more sustainable lifestyles. The production of meat for an average inhabitant of a G-20 country requires more than 1000 cubic meters of water per year and more than 2000 cubic meters per year for an average US citizen (Source: Fleischatlas 2013, Hoekstra & Mekonnen). The global meat production of 300 Million tons/year is responsible for more than 20% of all greenhouse gas emissions, according to WWF.
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<td>- Göran Andersson</td>
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<td>Introduction to the Conference:</td>
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<td>- Lorenz Hilty</td>
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<td>- Pierre-Alain Graf</td>
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<td>Plenary Lectures:</td>
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<td>Introduction to the Conference Recommendations</td>
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<td>12:40-14:00</td>
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<td>14:00-16:00</td>
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<td><strong>B1: Smart Resource Management</strong> Room D7.1</td>
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<td>- Jorge Marx Gómez</td>
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<td>16:30-18:30</td>
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<td>- Daniel Schien</td>
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<td>Conference Dinner / Banquet <em>(Voucher needed)</em> ETH Dozentenfoyer</td>
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09:00-10:10 | P1: Opening Session

Plenary Session 1, Room E7
Chaired by Peter Woodward

09:00-09:30
Conference Welcome

Peter Woodward, Conference Facilitator, Quest Associates, Coventry, United Kingdom
Gian-Luca Bona, Director General, Empa – Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland
Göran Andersson, Energy Science Center, ETH Zurich, Switzerland

09:30-9:40
Introduction to the Conference

Lorenz Hilty, Conference Chair, University of Zurich and Empa, Switzerland

09:40-10:10
Electricity Networks and ICT – the Chain to Sustainability

Pierre-Alain Graf, CEO Swissgrid, Frick, Switzerland

Abstract. The electricity system is undergoing fundamental changes: the (political) focus on reduction of carbon emissions leads to increased demands on energy efficiency, substitution of fossil fuels with electricity and replacement of traditional electricity production with renewables. As a result demand for electricity and thus for power transportation capacities is expected to increase. These developments make the electricity transmission and distribution infrastructure a critical element in the transition towards sustainability. Creating a regulatory environment with suitable economic incentives for making efficient use of the existing infrastructure and building new capacities is a major issue which needs to be resolved. Information technologies and the availability of data will play an increasingly important role, both in managing the electricity system as well as the consumption of electricity. This is especially true in determining the optimal allocation of capacities and resources and in defining the trade-off between better usage of the infrastructure in place versus the creation of new capacities. Thus the combination of electricity networks and ICT is an important link in the chain to sustainability.
10:40-11:10

**The Economic Imperative of ICT**

*John “Skip” Laitner, Economic and Social Analysis Program Director, American Council for an Energy-Efficient Economy*

**Abstract.** The productivity of global economy is lagging. Big time. A major reason is the huge constraint imposed by the inefficient use of energy. In the U.S. we waste 86 percent of all the energy consumed within the economic process. That magnitude of waste imposes a very large cost on all economic activity. If we are to regain momentum, and if we are to building long-term sustainability, then we must tackle the very large problem of our energy (in)efficiency. In effect, we need to look for ways that triple or quadruple our current level of 14 percent efficiency. The next generation of efficiency improvements will move away from device efficiency to system and infrastructure optimization. ICT will be the key to unlocking those future opportunities – especially as we look to develop a sustainable economy.

11:10-11:40

**Interactions between Energy, Information and Growth**

*Daniel Spreng, Prof. em., ETH Zurich*

**Abstract.** ICT has huge potential to contribute to sustainable development. Doing things in a more controlled and intelligent manner can be an essential ingredient for a long-term viable future. Often energy consumption is used as a proxy for sustainability. The theme of this conference is then the effect of ICT on energy consumption. However, the discussion of the direct relationship between ICT and energy consumption is incomplete. Time, interacting both strongly with ICT and energy, has to be added to the equation.

In the 1970’s I made the observation that to save energy one needed either more information and/or more time. This observation led me to the hypothesis that energy, time and information can be seen as the main production factors for tasks, processes, services and products and that they are partially substitutable for each other.
Experience and my own research shows that ICT can be used to save energy or to save time and that, given the choice, we almost always choose time. ICT can speed-up production and consumption. It can also make processes and practices more sustainable. However, by choosing time we choose the less sustainable path. The talk will present examples and will suggest ways of directing choices towards more sustainability, i.e. towards qualitative rather than quantitative growth.

11:40-12:10

Reports from Pre-Conference Activities

Green Hackathon
Jorge Zapico

Launch of the SECO-Empa Programme on Sustainable Recycling Industries
Rolf Widmer

ICT Solutions for Sustainable Lifestyles
Bas de Leuw

12:10-12:40

Introduction to the Draft Conference Recommendations and Discussion
Peter Woodward and Lorenz Hilty

You will find a draft document entitled How to Improve the Contribution of ICT to Sustainability in the envelope you received on check-in. This document summarises issues selected from the recommendations provided by the speakers of the conference. The text will be discussed during the event and developed into final conference recommendations. At this point, the draft will be briefly presented and discussed for the first time with the audience.

12:40-14:00 | Lunch and Poster Presentations

Room: Foyer E-Süd

13:00-14:00

The poster authors will be available at their posters in the Foyer.
14:00-16:00 | A1: ICT Hardware – Energy

Parallel Session A1, Room E7
Chaired by Reinhard Madlener and Vlad Coroama

14:00-14:20
The development of ICT Sector Guidance: rationale, development and outcomes
*Andie Stephens and Mark Didden*

14:20-14:40
The Future Carbon Footprint of the ICT and E&M Sectors
*Jens Malmodin, Pernilla Bergmark and Dag Lundén*

14:40-15:00
*Daniel R. Williams, Peter Thomond and Ian Mackenzie*

15:00-15:20
Capabilities and Limitations of Direct Free Cooling in Data Centers
*Peter Gysel, Rolf Morf, Cyrill Grüter and Matthias Krebs*

15:20-15:40
Energy Consumption of Smart Meters
*Michael Preisel, Adriana Diaz and Wolfgang Wimmer*

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14:00-16:00 | B1: Smart Resource Management

Parallel Session B1 | Room D7.1
Chaired by Jorge Marx Gómez and Kristina Voigt

14:00-14:30
Keynote: Data-Driven Resource Management
*Marko Turpeinen (The Royal Institute of Technology, Sweden)*

14:30-14:50
Smart Metering Infrastructure for Residential Water Efficiency: Results of a Trial in a Behavioural Change Program in Perth, Western Australia
*Martin Anda, Fabian Le Gay Brereton and Elise Paskett*

14:50-15:10
IT System for Computer Aided Management of Communal Water Networks by Means of GIS, SCADA, Mathematical Models and Optimization Algorithms
*Jan Studziński*
15:10-15:30  
Using ICT for Climate Adaptation and Mitigation through Agro-Ecology in the Developing World  
*Helena Grunfeld and John Houghton*

15:30-15:50  
EcoLogTex: a Software Tool Supporting the Design of Sustainable Supply Chains for Textiles  
*Andrea-Emilio Rizzoli, Heinz Zeller, Mireille Faist, Roberto Montemanni, Michela Gioacchini and Nicola Nembrini*

15:50-16:10  
Incentives for Inter-Organizational Environmental Information Systems  
*Hans Thies and Katarina Stanoevska-Slabeva*

### 16:30-18:30  |  A2: ICT Hardware - Materials

Parallel Session A2, Room E7  
Chaired by Daniel Schien

16:30-17:00  
Keynote: Scarce Metals as Raw Materials for ICTs: Do We Care Enough?  
*Patrick Wäger and Rolf Widmer*

17:00-17:20  
Social Life Cycle Inventory and Impact Assessment of Informal Recycling of Electronic ICT Waste in Pakistan  
*Shakila Umair, Anna Björklund and Elisabeth Ekener Petersen*

17:20-17:40  
Insights from a Decade of Development Cooperation in E-Waste Management  
*Mathias Schluep, Esther Müller, Lorenz M. Hilty, Daniel Ott, Rolf Widmer and Heinz Böni*

17:40-18:00  
Acceptance of Mobile Phone Return Programs: A Case Study Based Analysis  
*Britta Bookhagen, Julia Nordmann, Inger Dyrnes, Oliver Stengel and Nils-Holger Schmidt*

18.00-18:20  
Towards Zero Waste in Industrial Networks: A Case Study of the D4R Laptop  
*Peter Beigl, Stewart Hickey, Gudrun Obersteiner, Colin Fitzpatrick, Karsten Schischke, Paul Maher and Jose Ospina*
16:30-18:30 | B2: Smart Buildings and Cities

Parallel Session B2, Room D7.1
Chaired by Stefan Naumann and Andrea-Emilio Rizzoli

16:30-16:50
Building Sustainable Smart Homes
Marco Blumendorf

16:50-17:10
BubbleSense: Wireless Sensor Network Based Intelligent Building Monitoring
Cheng Li, Forrest Meggers, Mo Li, Jithendrian Sundaravaradan, Fei Xue, Hock Beng Lim and Arno Schlüeter

17:10-17:30
Urban Social Sustainability through the Web: Using ICTs to Build a Community for Prospective Neighbors
Eun Ji Cho and Liat Rogel

17:30-17:50
Evaluating Sustainability of Using ICT Solutions in Smart Cities – Methodology Requirements
Nina Lövehagen and Anna Bondesson

17:50-18:10
ICT for Sustainable Cities: How Can ICT Support Environmentally Sustainable Development in Cities?
Anna Kramers, Mattias Höjer, Nina Lövehagen and Josefin Wangel

18:10-18:30
Energy Efficiency in Hammarby Sjöstad, Stockholm through ICT and Smarter Infrastructure – Survey and Potentials
Örjan Svane
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<td>- Robert Laubacher</td>
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<td>- Elaine M. Huang</td>
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<td>16:00-16:30</td>
<td>Coffee Break</td>
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<td>16:30-18:00</td>
<td><strong>P4: Panel Discussion</strong> Room E7</td>
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<td>‘Wicked Issues’ and Final Recommendations</td>
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<td>Expert Panel and audience discuss key conference insights, issues and</td>
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<td>recommendations</td>
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<td>Chaired by Peter Woodward</td>
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<td>18:00-23:00</td>
<td>Conference Soirée</td>
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<td>• Reception — Drinks and Snacks, Foyer E-Süd</td>
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<td>• 19:30 Dance Show “Angina Electrica” and Dinner Party</td>
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<td>“Kaufleuten”, Pelikanplatz, Zürich (<em>Voucher needed</em>)</td>
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9:00-10:30 | P3: New Horizons

Plenary Session 3, Room E7
Chaired by Peter Woodward

9:00-9:10
Visual protocols of Day 1 and Introduction to Day 2
Reinhard Kuchenmüller, Marianne Stifel, Peter Woodward

9:10-9:40
Harnessing Collective Intelligence to Address Climate Change: The Climate CoLab
Robert Laubacher, Research Scientist, Center for Collective Intelligence, MIT Sloan School of Management, USA

Abstract. The Climate CoLab, a project of the MIT Center for Collective Intelligence, seeks to apply the crowdsourcing approach used in systems like open source software and Wikipedia to develop, and gain support for, creative new ideas to address climate change. Anyone in the world can participate. The Climate CoLab community now includes more than 4000 students and concerned citizens, along with nearly 100 experts who guide its activities. For 2012-13, the CoLab has broken down the large, complex problem of climate change into a series of more manageable sub-problems. Participants will be invited to submit their ideas in contests that focus on topics like building efficiency, decarbonization of energy supply, and adaptation. A combination of expert judges and wisdom of the crowd will select the best ideas, and contest winners will then present their work to leaders in government, business, and civil society. In a subsequent round of activity, the Climate CoLab will invite integrated proposals that combine the best ideas from the various sub-domains. If it achieves its loftiest ambitions, the Climate CoLab will engage scientists, policy makers, executives, and citizens and lead to adoption of more effective strategies to address climate change than would have emerged otherwise.

9:40-10:10
Defining an Agenda for Computational Sustainability
Jennifer Mankoff, Prof., Carnegie Mellon University, Pittsburgh, PA, USA

Abstract. I will discuss approaches to energy feedback and some of the empirical work we have done as part of the Stepgreen.org project to guide the design of feedback displays. Our work, began in 2006 with social feedback, sensing and self reporting around green actions. I explore the question of what sort of impact work of this sort should have and demonstrate through a
discussion recent work with landlords and tenants in low-income communities, residents of bangalore, India, and automated techniques how a broader perspective may influence where and how we choose to apply IT. I conclude by suggesting that we develop a new set of metrics for judging IT for sustainability, and a new set of perspectives on what role IT may need to play going forward.

10:00-10:30
Discussion, Update on Conference Recommendations Formulation
Peter Woodward, Conference Facilitator

The next version of the Conference Recommendations based on your input will be presented and discussed.

11:00-13:00 | A3: Smart Energy Solutions

Parallel Session A3, Room E7
Chaired by Göran Andersson and Jean-Marc Pierson

11:00-11:30
Keynote: ICT for a Sustainable and Secure Electricity Supply System
Rainer Bacher, Bacher Energy Ltd.

11:30-11:50
Makahiki+WattDepot: An Open Source Software Stack for Next Generation Energy Research and Education
Philip M. Johnson, Yongwen Xu, Robert S. Brewer, Carleton A. Moore, George E. Lee and Andrea Connell

11:50-12:10
When Looking out of the Window is not Enough: Informing the Design of In-Home Technologies for Domestic Energy Microgeneration
Blaine Price, Janet Van Der Linden, Jacky Bourgeois and Gerd Kortuem

12:10-12:30
Developing a Strategy for the Implementation of ICT in Energy Efficient Neighbourhoods
Max Blöchle, Branislav Iglar, Daniele Basciotti and Jessen Page
11:00-13:00 | B3: Societal Aspects
Parallel Session B3, Room D7.1
Chaired by Michael Decker and Kristina Voigt

11:00-11:20
ICT as Motor for Transition: Towards a Low Energy, Low Carbon Society
*Josefin Wangel, Kristian Løbner and Marie Solgaard Bang*

11:20-11:40
Practicing the Smart Grid
*Cecilia Katzeff and Josefin Wangel*

11:20-12:00
From Fixed, Mobile to Complex – The Social Shaping of ICT for Sustainable Travel
*Carlos Cano Viktorsson*

12:00-12:20
Towards a Holistic Assessment of Environmental Impacts from ICT: the Case of E-Commerce
*Miriam Börjesson Rivera, Cecilia Håkansson, Åsa Svenfelt and Göran Finnveden*

12:20-12:40
National Collaboration on Green ICT in the Dutch Higher Education: Lessons Learned
*Albert Hankel*

12:40-13:00
Translating Green IT: The Case of the Swedish Green IT Audit
*Per Fors and Thomas Taro Lennerfors*

14:00-16:00 | A4: ICT Software – Energy
Parallel Session A4, Room E7
Chaired by Patricia Lago and Wolfgang Lohmann

14:00-14:30
Keynote: Energy Consumption from a Software Perspective
*Jean-Marc Pierson (Institut de Recherche en Informatique de Toulouse, France)*

14:30-14:50
Green Software and Green Software Engineering – Definitions, Measurements, and Quality Aspects
*Eva Kern, Markus Dick, Stefan Naumann, Achim Gaulner and Timo Johann*
14:50-15:10
The Impact of Improving Software Functionality on Environmental Sustainability
Sedef Akınlı Koçak, Andriy Miriansky, Gülşem İşıklar Alptekin, Ayşe Başar Bener and Enzo Cialini

15:10-15:30
Identification of Application-Level Energy-Optimizations
Kay Grosskop and Joost Visser

15:30-15:50
Pilot Result Monitoring Energy Usage by Software
Frank Van Bokhoven and Jarno Bloem

14:00-16:00 | B4: Smart Decisions
Parallel Session B4, Room D7.1
Chaired by Elaine M. Huang

14:00-14:20
Data Mining in the Closed-Loop CRM-Approach for Improving Sustainable Intermodal Mobility
Thees Gieselmann, Marcel Severith, Benjamin Wagner vom Berg and Jorge Marx Gómez

14:20-14:40
An Awareness Based Approach to Avoid Rebound Effects in ICT
Giovanna Sissa

14:40-15:00
mat – an ICT Application to Support a More Sustainable Use of Print Products and ICT Devices
Roland Hischier, Michael Keller, Rudolf Lisibach and Lorenz M. Hilty

15:00-15:20
Climate Change Impact of Electronic Media Solutions: Case Study of the Tablet Edition of a Magazine
Mohammad Ahmadi Achachloouei, Åsa Moberg and Elisabeth Hochschorner

15:20-15:40
Small Community Media for Sustainable Consumption
Gergely Lukács
16:30-18:00 | P4: Panel Discussion

Plenary Session 4, Room E7
Chaired by Peter Woodward

‘Wicked Issues’ and Recommendations

Expert panel and audience discuss key conference insights, ‘wicked issues’ and the final Conference Recommendations.

Most of the experts on the panel will be recruited during the conference. Therefore, there is no list of names attached to this item.

18:00-23:00 | Conference Soirée

ETH Foyer E-Süd, and "Kaufleuten", Pelikanplatz, Zurich
This Soirée is open to all participants of the main conference.

18:00-19:00
Reception – Drinks & Snacks at ETH Foyer E-Süd
This Welcome Reception is kindly sponsored by the City and the Canton of Zurich.

19:30-20:00
Dance Performance: Angina Electrica
Kaufleuten, Pelikanplatz, Zurich

Securing the Trace of an Encounter of Kinetic and Electric Energy

In this tongue-in-cheek performance, two dancers being dressed for the worst case situation present an emergency scenario against threatening energy shortages in the murk periods of time.

Therefore, dancers and the audience will together produce the energy required to lighten the piece and to provide the acoustic surrounding. Electra, a specially designed electric power generator, will be used to transform in an archaic manner the physical energy into electric energy; environmental sustainability is guaranteed.

Noémie Wyss and Nina Willimann do not only examine the relations between the different forms of physical energy, but also the tension between two individuals and the energy that is released due to their friction.

After the show: Dinner Party at "Kaufleuten" (sponsored part will end at 23:00)
From ETH to Kaufleuten by Tram 9 in 20-25 minutes from door to door.
(You got a free ticket for public transport.)
From ETH to Kaufleuten on foot (1.5 km) through the center of Zürich. (A guide will leave at 18:45 from the conference reception desk.)

You will need the voucher contained in your nametag for the evening at Kaufleuten!

ICT4S Best Poster Award
ICT4S Best Paper Award
Awarding Ceremony at the Conference Soirée at Kaufleuten, Friday about 21:00
Jury Chaired by Bernard Aebischer, Honorary Chair of ICT4S
### SATURDAY

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tr>
<td>08:00-09:00</td>
<td>Registration Desk Open 08:00-12:00</td>
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| 09:00-12:00| **Workshop A:** Sustainability, Social Accountability and Computing by IFIP TC9  
Room F26.5  
Chaired by Diane Whitehouse |
| 09:00-12:00| **Workshop B:** PhD Students’ Workshop  
by University of Zurich, Dept. of Informatics  
Room E7  
Chaired by Martina Huber |
| 09:00-12:00| **Workshop C:** Swiss Workshop  
by BAKOM and ARE  
Language: German  
Room D7.1 |
| 10:25-11:20| Coffee Served                             |
| 12:00-13:30| Lunch Served                              |
| 14:20-15:05| Coffee Served                             |
| 18:00-18:00| **End:**                                   |

### 9:00-18:00 | Workshop A

Room F26.5  
**Sustainability, Social Accountability and Computing**  
Chaired by Diane Whitehouse, IFIP WG 9.2 Chair  
*IFIP, International Federation for Information Processing, Technical Committee 9: Computers and Society*

Joint Workshop of the IFIP TC9 Working Groups  
- 9.2: Social Accountability and Computing  
- 9.9: ICT and Sustainable Development
9:00-16:00 | Workshop B

Room E7

**PhD Students’ Workshop**

Chaired by Martina Huber

*Informatics and Sustainability Research Group, Department of Informatics, University of Zurich*

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09:00-10:25 Session 1: Opening Session

*Feedback given by: Andrea Emilio Rizzoli*

09:00-09:10

Welcome Address

_Martina Huber, PhD Student, University of Zurich, Switzerland_

General Aspects

09:10-09:35

The Potential for Environmental Savings – Restrictions, Internal Standards and Approaches

_Christina Herzog, University of Toulouse, France_

09:35-10:00

Developing a Comprehensive Approach to Incorporate Uncertain Knowledge into a Material Flow Model

_Nikolaus Bornhöft, Technology and Society Lab at Empa – Swiss Federal Laboratories for Materials Science and Technology, St. Gallen, Switzerland_

10:00-10:25

Designing a Serious Game Framework for Sustainability

_Yongwen Xu, University of Hawaii at Manoa, USA_

10:25-10:45

Coffee Break

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10:45-12:25 Session 2: Be Prepared for Behavioral Change

*Feedback given by: Elaine M. Huang*

10:45-11:10

Sustainability Assessment Model to Mitigate Electronic Waste Threat from Low Cost Computers for Schools in Developing Countries

_Simon Karume, Masinde Muliro University of Science and Technology, Kenya_

11:10-11:35

Do You Fear Telework? Understanding the “Petrify Effect” in the Experience of Torino Municipality

_Claudio Marciano, Università La Sapienza – Roma, Italy_

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11:35-12:00  
Towards Automated Non-Intrusive Load Monitoring Evaluation  
*Lucas Pereira, Madeira-ITI, Portugal*

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12:00-13:30 Lunch

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13:30-14:15 Session 3: Sustainable Energy Consumption through ICT  
*Feedback given by: Jean-Marc Pierson*

13:30-13:55  
Continuous Scheduling for Grid-Stabilizing Coalitions in Decentralized Energy Systems  
*Astrid Nieße, OFFIS, Germany*

13:55-14:20  
Towards a Unified Energy Efficiency Evaluation Toolset: An Approach and its Implementation at Leibniz Supercomputing Centre (LRZ)  
*Hayk Shoukourian, Technische Universität München; Torsten Wilde, Leibniz Supercomputing Centre (LRZ) of the Bavarian Academy of Sciences and Humanities; Axel Auweter, Leibniz Supercomputing Centre (LRZ) of the Bavarian Academy of Sciences and Humanities; Arndt Bode, Technische Universität München, Leibniz Supercomputing Centre (LRZ) of the Bavarian Academy of Sciences and Humanities; Petra Piochacz, Technische Universität München, Germany*

14:20-14:45  
Can Proxies Be Used to Save Power?  
*Karl O’Dwyer, Hamilton Institute; David Malone, Hamilton Institute; Eoin Creedon, IBM Research; Mark Purcell, IBM Research, Ireland*

14:45-15:05 Coffee Break

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15:05-16:00 Session 4: Sustainable Energy Consumption through ICT  
*Feedback given by: Skip Laitner*

15:05-15:30  
Web Servers’ Energy Efficiency, VlruaLization and Performance (WEEVIL)  
*Khaled Chait, Research Center on Scientific and Technical Information, Algeria*

15:30-15:55  
Resources Provisioning in the Cloud  
*Kleopatra Chatziprimou, Kevin Lano, Steffen Zschaler, King’s College London, UK*
09:30-16:30 | Workshop C: Swiss Workshop

Room D7.2 plus F 33.1 & F 33.5

Nachhaltige Entwicklung und Informationsgesellschaft (in German)

BAKOM (Bundesamt für Kommunikation) und ARE (Bundesamt für Raumentwicklung)

Der Schweizer Bundesrat verfolgt eine Strategie Nachhaltige Entwicklung und eine Strategie Informationsgesellschaft. Wie können sich die strategischen Ziele aus beiden Bereichen gegenseitig unterstützen? Wie lässt sich der Wandel in Richtung einer Informationsgesellschaft für die nachhaltige Entwicklung nutzen? Wie fördern Herausforderungen aus dem Bereich der Nachhaltigkeit die Innovation auf dem Gebiet der Informations- und Kommunikationstechnologien?

Hauptziel des Workshops ist es, eine Plattform für die Zusammenarbeit zu schaffen für alle, die zwischen Informationsgesellschaft und Nachhaltigkeit Brücken schlagen: In Politik, Forschung und Praxis.

Der Swiss Workshop soll Brücken schlagen und Synergien aufzeigen zwischen den Megatrends Informationsgesellschaft und der Nachhaltigen Entwicklung. Er soll als Startveranstaltung eine längerfristige Dynamik in Gang setzen, damit die relevanten Akteure in der Schweiz die Zusammenhänge zwischen der Informationsgesellschaft und der Nachhaltigen Entwicklung vertiefen, weiterverfolgen und in ihre alltägliche Arbeit in diesem Bereich einfließen lassen. Zudem erhoffen sich die Bundesämter ARE und BAKOM wertvolle Erkenntnisse und Rückmeldungen aus der Praxis für die weitere Umsetzung der Strategie Nachhaltige Entwicklung bzw. die Strategie Informationsgesellschaft des Bundes.

Programm

9:30 Eintreffen der Gäste mit Kaffee/Gipfeli
10:00-10:30 Begrüssung/Moderation sowie Einführung ins Workshop-Thema
10:30-11:00 Keynote: „ICT als Enabler für die Stromzukunft“ Prof. Anton Gunzinger, ETH Zurich
11:00-11:20 Kaffeepause
11:20-11:40 Referat „Nachhaltige Beschaffung“ Jean-Marc Hensch, Geschäftsführer Swico
11:40-12:00 Referat „Mobiles Arbeiten“ Ingrid Kissling, EBP
12:00-13:15 Stehlunch
13:15-14:00 5 parallele Workshops

- Beitrag ICT zur E-Mobilität
- Beitrag ICT zur 2000-Watt-Gesellschaft im Bereich Gebäudetechnik
- Förderung eines nachhaltigen Verhaltens durch Web
- Soziale Standards in der Produktion und Entsorgung von ICT-Hardware
- Implementierung Sustainable ICT im Unternehmen

14:00-14:20 Ergebnisse Workshops im Plenum
14:20-14:40 Kaffeepause
14:40-16:00 World Café – Umsetzung Sustainable ICT in zwei Gesprächsrunden
16:00-16:30 Schluss-Synthese Swiss Workshop
16:30 Ende der Veranstaltung