

ISIE News

International Society For Industrial Ecology

2011 IS ALMOST OVER—HERE IS A SUMMARY OF YOUR GREAT RECENT ACHIEVEMENTS

Special points of interest:

- ISIE Sections update
- JIE News
- IE news from around the world
- Recent and Upcoming Conferences
- IE Training programs
- New IE projects and programs
- Open positions
- Members News

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Dear ISIE Community,

The year of 2011 is almost over... we had a great year with many achievements of our members.

The expansion of the industrial ecology field is gaining momentum and more and more governments, businesses, and academic institutions are integrating IE thinking into their decision processes, as well as supporting IE programs.

As you will notice, this issue of the ISIE newsletter is especially long and contains many news items. This is another indication that our society is growing and becoming more substantial. Thanks everybody for sharing your achievements and news.

I wish all of you a great holidays season. After a bit of holidays rest, we will all be ready for a new and even more exciting year to come.

*All the best,
Vered Blass, Editor*

Organizing Sustainable Consumption and Production Section Update, Kikki Baumann

Great interest for new section on the greening of product chains:

The section on Organising Sustainable Consumption and Production (OSCP) held a first gathering in June in Berkeley to check the level of interest for working more systematically with untangling the issues of sustainable product chains. Around 40 scholars contributed to a group conversation called for by Dr Frank Boons (EUR, NL) and Dr Kikki Baumann (Chalmers, Swe). People shared their views on product chains problems, and perhaps more importantly, the process on how to proceed with OSCP was addressed. Two things were decided: The first being a workshop to be held in June 2012 in Rotterdam. The other being that the full formalization will take place during the years before the next ISIE conference. The formalization of OSCP will require the development of bye-laws. Also members for a council of the OSCP need to be identified, nominated and elected. Other possible tasks for the OSCP were discussed, e.g. an international PhD course and publishing channels.



The 'Interim' OSCP council:

A small group of people volunteered to contribute to getting OSCP operating. In addition to Kikki Baumann and Frank Boons, also Vered Blass (Tel Aviv University; ISIE newsletter editor), Anthony Shun Fung Chiu (De La Salle University; Chairman of the Asia-Pacific Roundtable for Sustainable Consumption), Martina Keitsch (NTNU & Oslo School of Architecture and Design) and Michael Søgård Jørgensen (DTU Management, Denmark).

Pluri-disciplinary workshop on sustainability of product chains and their research problems

The OSCP will organize a small 2-day workshop (max 30 participants) to collect research perspectives on the sustainability of product chains. Research on this topic can be found in various academic communities. The task is to get scholars for varying fields together, and to collectively develop an overview of the state of knowledge.

The workshop will take place in Rotterdam, the Netherlands, on 15-16 June 2012.

If you want to contribute to the workshop, please contact either Frank Boons (boons@fsw.eur.nl) or Kikki Baumann (henrikke.baumann@chalmers.se).

Life Cycle Sustainability Assessment (LCSA) section update, Jeroen Guinée

The LCSA section currently has 56 members! The final version of minutes of the ISIE LCSA section kick-off meeting that took place during the ISIE Berkeley conference on June 7 was distributed. A number of suggestions were received from section members on topics that the section could take up in the coming years. Greg Norris and Jeroen Guinée are currently thinking about strategies how to proceed from here on. The first thing to do is draft a process proposal on how the LCSA section could develop in say 1-2 years. This proposal includes suggestions on both organisation (how to best organise activities without additional travelling and extra meetings, too much time spending etc.) and contents of activities (on which topic(s) to focus in year 1-2 and who could be involved), and on drafting bylaws for the section. The work on this is still on-going.

Sustainable Urban Systems (SUS) Section Update, Anu Ramaswami

Workshop at ISIE Berkeley: The workshop was well-attended by 50 members of the SUS community, including students, professors, professionals applying ISIE tools in different domains, and local government officials. More than 60% of those attending presented short descriptions of their work, spanning presentations from Asia, Australia, Europe, and North America.

Membership Deadline to join ISIE & SUS Section: As of today, less than 50% of the workshop attendees have joined ISIE. Please join ISIE since starting November 1m 2011 the SUS communications and knowledge sharing will occur via the ISIE SUS Members-Only web site.

SUS Short Mission Statement: Based on feedback from the workshop, the SUS Board has developed the following one-line mission statement describing what the SUS section does:

The sustainable urban systems (SUS) section of the ISIE promotes a systems approach across multiple disciplines for scientific analysis that informs the development of sustainable, healthy and resilient urban areas.

This is an applied, cross-cutting, highly multi-disciplinary section in which various methods, such as LCA, MFA, EIO, complex systems theory and thermodynamics, are applied at the urban scale and integrated with the study of social actors (people) who shape urban systems toward sustainability goals. Issues addressed include (but are not limited to): developing urban infrastructure for low carbon cities; urban waste management and material recycling; urban transportation; green buildings; sustainable water and nutrient management; urban energy systems; resilient cities; adapting cities to climate change, provision of infrastructure for the urban poor, informing sustainable policy development and promoting sustainable behaviors in cities. Practical solutions to these issues are informed through study of urban ecology, urban metabolism, the dynamics of city growth and interdependency between social actors, institutions and the biophysical system flows. Membership of the section is broad ranging, including: urban planners, architects, geographers, engineers, economists, environmental scientists, policymakers, social scientists and others.

The section has drafted a detailed mission and goals definitions. For the full description of the mission and goals of the section, please contact Anu Ramaswami at Anu.Ramaswami@ucdenver.edu.

Several SUS members were part of a winning Research Collaborative Network (RCN) Proposal that was recently awarded by NSF. The RCN on Sustainable Cities provides funding for workshops and web site development for 4 years (\$750k) starting 1/2012, and is led by several SUS community members, including PIs Anu Ramaswami (UC Denver), Marian Chertow (Yale) and Larry Baker (U MN), as well many others from the IE community: Scott Matthews, John Fernandez, Clint Andrews, Eric Williams, Helga Weisz, and others. The goal is to reach out not only to ISIE members, but more broadly to all the disciplines relevant to SUS. A summary of the NSF RCN on Sustainable Cities can be found here: <http://www.nsf.gov/awardsearch/showAward.do?AwardNumber=1140384>

The section is therefore in the process of developing an MOU between that NSF award and the ISIE- SUS section to articulate future work.

Overall the SUS section has made significant progress in its first year. Please help us wrap up an excellent launch-year by answering a quick survey (only five questions) that will help us know our current membership, our future potential members, and our knowledge base better by answering the survey in the following link:

<http://www.surveymonkey.com/s/SUSOctober2011survey>

To become a SUS member – please contact elizabeth.thomas@yale.edu

Student Chapter has a New Board, Welcome!

Graham Aid is an Industrial Ph.D. Candidate at the Royal Institute of Technology (KTH) in Stockholm, Sweden. His research at KTH is focused on participatory and collaboration methods in conjunction with IE cases surrounding construction and demolition recycling as well as industrial symbiosis. He also works at the Swedish waste management company Ragn-Sells developing niche recycling markets.



Simone Pereira de Souza is Environmental Engineer and has a master's degree in Environmental Engineering Science at University of Sao Paulo (USP, Brazil). Currently she is a first year doctoral student in Energy Planning at the State University of Campinas (UNICAMP, Brazil). She is also a fellow at the Brazilian Bioethanol Science and Technology Laboratory (CTBE) where researches of Life Cycle Assessment, Input-Output and Life Cycle Costs are applied to the sucroenergetic sector. Her researches include applying the Industrial Ecology techniques in studies of biorefinery, biofuels, greenhouse gas emission, land use change, energy balance.



Susan Spierre (President) is a Ph.D. student in the Global Institute of Sustainability at Arizona State University. She has a master's degree in Earth Sciences and a bachelor's in Atmospheric Science. Currently, her research interests are climate change policy, ethics surrounding climate change mitigation, and sustainable development in underdeveloped countries.

Susan is also a Research Assistant that is contributing to a NSF funded project on Sustainability Ethics Education.

Emma Keller is a second year EngD research engineer within the Centre of Environmental Strategy at the University of Surrey and is working in collaboration with Sustainability R&D at Unilever. She is working on identifying and tracking GHG emissions through agri-food supply chains, focusing specifically on how to capture GHG information at the farm-level and communicate it through the chain. Emma has a wider interest in sustainability issues and policy and is keen to work on extending the link between academia and industry within industrial ecology to see changes happen in practice. Through involvement in the student chapter, she hopes to begin to build this link and create new networks of academics and practitioners as well as building the engagement and representation of the student body within the



Ankit Aggarwal is from India and is presently pursuing International masters program (MSc. Sustainable Resource Management) at Technical University of Munich in Germany. His research interests includes application of industrial ecology in developing countries especially industrial symbiosis. Other than sharing passion for participating and facilitating participatory dialogues and processes (world

cafe, appreciative inquiry and open space technology), he enjoys long distance running and traveling.



Yu (Vivian) Li is currently a PhD candidate in the Department of Wood Science, Faculty of Forestry at the University of British Columbia. Her research uses Material Flow and Value Chain Analyses to evaluate the socio-economic contributions of the forest products industries. The goal of this research is to improve our understanding of how the material flow dynamics influence forestry sector's social and economic benefits. She has been serving on the ISIE Student Chapter Board since Mar. 2010. She has been actively involved in organizing student activities and was responsible for organizing poster competition and social events. She will be happy to devote her time and energy to enhance the ISIE student chapter with all the colleagues who share the same interest and enthusiasm.



For more information about the chapter, please visit:

<http://www.is4ie.org/students>

JIE News, Reid Lifset

Several papers in the *JIE* have recently attracted press and policy interest.

A paper assessing the adequacy of lithium supplies for electric cars by Paul Gruber, Pablo Medina, Greg Keoleian, Stephen Kesler, Mark Everson, and Timothy Wallington (JIE 15:5) was discussed in the *New York Times* electronic edition and in ClimateWire, a newsletter of the Greenwire group.

The story was then picked by investment, R&D and environmental blogs and news services.

A paper on waste management implications of smart textiles by Andreas Köhler, Lorenz M. Hilty, and Conny

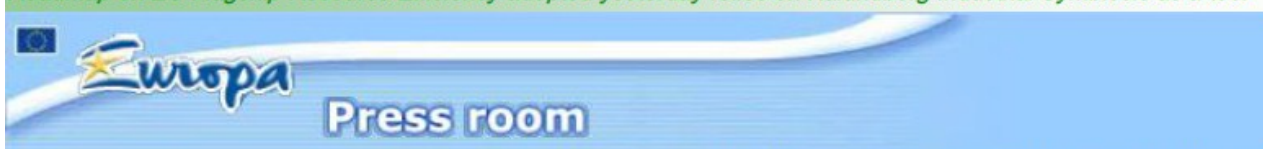
Bakker (JIE 15:4) was the subject of a blog by Heather Clancy of ZDNet, a prominent computer industry publisher, and then picked up by Ecouterre, a website on sustainable fashion design, and additionally by a news service maintained by Redemtech, a US-based e-waste management company.

Pere Fullana's paper on life cycle management (JIE 15:3), which also received an award from the ISIE at the Capetown LCM conference in 2009, was the focus of complimentary coverage in the recycling portal of the European Union.

Do you receive the *JIE* table of contents alerts? If not, be sure to sign up to receive these emails or RSS feeds so that you always have the latest in industrial ecology research. Just go to <http://onlinelibrary.wiley.com/user-registration> and follow the instructions for registration. If you need assistance, contact the editorial office at indecol@yale.edu.

Industrial Ecology in the News

Roadmap on EU Flagship Resource Efficiency adopted yesterday relies on Kalundborg Industrial Symbiosis as a tool



Commission sets out the path to resource-efficient growth ...
20/09/11 - European Commission

Environment Commissioner Janez Potočnik said: "Green growth is the only sustainable future – for Europe and the world. Industry and environment need to work hand in hand – in the long term our interests are the same."

- VIDEO. Press conference by Janez Potočnik
- Questions and answers on the Resource Efficiency Roadmap
- More information on Resource Efficiency



EU Commissioner Potocnic: "Industrial Symbiosis... should be standard procedure by 2020", EU Green Week 2011



First in the World. Kalundborg Industrial Symbiosis is a beacon within resource efficiency acknowledge by the EU and not least China, who passed their Law on Circular Economy in 2008 having Kalundborg Symbiosis as aspiration for preparing this decisive law.

Kalundborg "Industrial Symbiosis" is the World's first and most structured industrial ecology cluster and has been in operation since 1961. The notion "Industrial Symbiosis" is conceived in Kalundborg in 1972 featuring a system, where one industry's waste is another's resource. It is based upon voluntary bi- and trilateral exchange schemes driven by economy of scale.

Through investments in key technologies, production cost have been cut by billions of euros impacting nature positively with annual savings of 240.000 CO₂; 3 mio. m³ water; 150.000 tons of biofertilizer replacing chemicals, 150.000 tons of bio-feed replacing soybean protein; 150.000 tons gypsum from desulphurization replaces natural gypsum, etc.

More info: www.symbiosis.dk
e-mail: andersen@kalundborg.dk



Green Week 2011:
EU Environment Commissioner Potocnic is impressed by Kalundborg Industrial Symbiosis presented by Kalundborg EU-Office Director Martin Andersen

Photo Patrick Mascart

Resource Optimization Initiative (ROI)- Industrial Ecology in Developing Countries, By Megha Shenoy

Resource Optimization Initiative (ROI) was founded by Mr. Ramesh Ramaswamy and Prof. Suren Erkman in 2004 with the goal of promoting the concepts, methods and tools of industrial ecology in India. ROI is one of the first groups in the developing world to apply the theory, methods, and tools of industrial ecology to inform policy and strategies for sustainable development.

The mission of ROI is to promote the implementation of concepts and tools of industrial ecology in development and business planning processes in developing countries. Towards accomplishing its mission, ROI's activities include:

- Investigating and promoting equitable access to and distribution of resources in industrial and agrarian regions in India.
- Evaluating and promoting locally available renewable sources of energy to reduce greenhouse gas emissions and global warming potential.
- Characterizing social, economic and environmental benefits and costs associated with extraction, production and consumption of natural resources.
- Introducing concepts and tools based on industrial ecology, to policy makers in governments and businesses of developing countries, for optimal utilization of resources by current and future generations.

Our main strength is in the use of clear and effective research methodology to provide insightful information about current practices and effective solutions for converting currently unsustainable practices in resource utilization to sustainable ones. We adopt a broad definition of resources to include not only land, water, air and materials but also knowledge, social capital and tradition, so that the solutions we provide

are reliable and have long term positive effects for participating communities. We have always believed that such solutions will be effective only if all important social, economic and environmental variables are taken into consideration.

Over the years ROI has successfully been involved in over 20 research investigations throughout India, including 5 case studies published in a book on industrial ecology by Erkman and Ramaswamy in 2003. The entire book can be downloaded for free from <http://www.roi-online.org/viewbooks.php> We are currently investigating resource consumption patterns to recommend strategies to optimize material and energy flows in industries and agricultural regions.

Resource Optimization Initiative (ROI) | Bangalore, Graduate Institute of International and Development Studies | Geneva, Switzerland along with swissnex | India, and Indian Institute of Management | Bangalore and are organizing a public one day symposium on "Energy in India - Governance and Geopolitics" on Monday 28 November 2011 at the Indian Institute of Management, Bangalore.

We look forward to continued collaboration with groups committed to investigating and implementing sustainable strategies in developing countries, especially India.

For more information about ROI please contact Megha Shenoy, Research Director
megha@roi-online.org

Web site:

www.roi-online.org

ROI's 2010 Activity Report:

http://www.roi-online.org/ROI_2010_Report.pdf

New Project: Metabolism Modeling of Urban Water Services, G. Venkatesh and H. Brattebø

New EU7FP research project, TRUST (Transitions to the Urban Water Services of Tomorrow). The project is synthesizing findings from previous EU projects, and at the same time developing a new course for how to implement long-term strategic transitions of urban water services, emphasizing emerging technologies, the water/carbon nexus efficiency, risk analysis, asset management, and overall sustainability of urban water systems.

For the first time, the multi-disciplinary field of industrial ecology and the toolbox thereof is fully integrated into this multi-disciplinary research activity, with a metabolism model of the urban water cycle system being the cornerstone. This modeling approach is inspired by recent years of successful collaboration with the city of Oslo's Department of Water and Wastewater Engineering (Oslo VAV), and from this basis we now plan to develop a generic metabolism model for urban water services, and then specify, calibrate and apply this to a series of urban water system cases throughout Europe, in a way so that local long-term challenges are brought to the attention. The metabolism concept is briefly outlined in Figure 1 below.

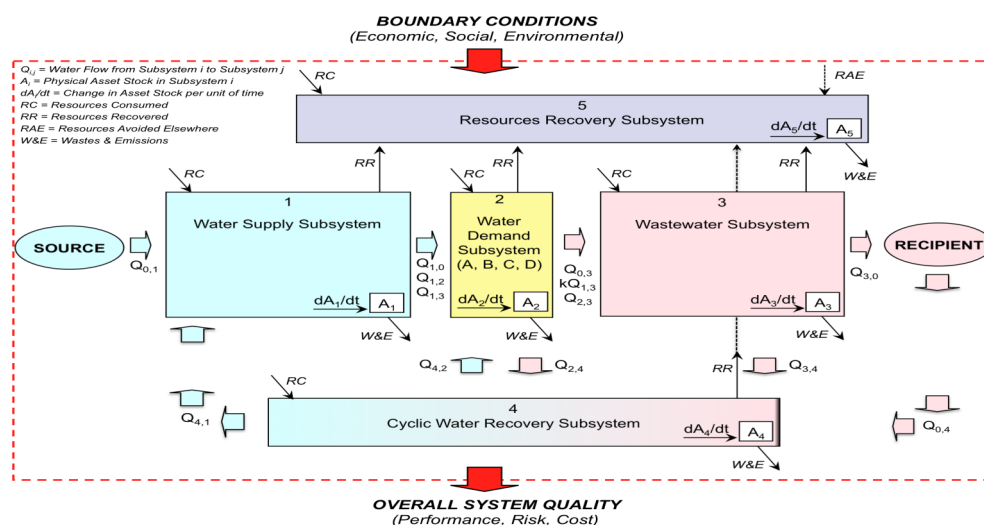


Figure 1: Metabolism model applied in TRUST

A common feature of many urban water systems is that the infrastructure is systematically ageing, often with an increasing maintenance backlog. At the same time many cities face long-term challenges of climate change, followed by high storm-water fluctuations and rising sea level, and potential flooding problems, parallel to energy and pollution efficiency requirements. Hence, sustainable urban water systems asset management approaches should adopt holistic assessment methods that examine and quantify the interrelationships between water flows, resource consumption, wastes and emissions, future cyclic water opportunities and resource recovery opportunities, and of course, also linking such information to strategic choices with respect to emerging technology and management opportunities, such as stronger focus on water/energy efficiency, water cycling and recovery of resources (materials, chemicals, energy, byproducts) throughout the water cycle system.

Apart from the metabolism model, which enables utilities to map the entire system and have an overview of the physical flows, the associated monetary flows and environmental impacts, there are several specialized tools that a utility would need on a regular basis to perform the maintenance and rehabilitation operations. Just as an industrial ecologist uses tools like MFA, LCA, LCC etc., to make the metabolism model useful, utilities would need to have a handy 'tool-box' they could dip into, to understand, maintain, manage and improve their systems. Industrial ecology adopts a holistic approach to problem solving. In this context, sustainability studies entail the consideration of a plethora of factors - climate change, energy scarcity, rising energy costs, population growth and rise in demand for services etc. All these factors put pressure on the management of the water service, increasing its vulnerability and the level of risk. Sustainable water networks must be designed and operated so as to minimize the number and consequences of failures, make most effective use of the existing assets, take into account uncertainty related to future development of the system, its service demand and reliability of existing technologies and management solutions, and even while doing so, meet the needs of the consumers – both now and in the future.

New EPSRC Centre for Innovative Manufacturing in Industrial Sustainability in the UK, by Nancy Bocken

The EPSRC Centre for Innovative Manufacturing in Industrial Sustainability is a collaboration between four leading universities and a host of businesses and organizations who are committed to meeting the challenge of industrial sustainability. By 2050, the global industrial system is expected to double its output to meet the needs of the world's growing population. This needs to be achieved using half the current level of resources and 20% of greenhouse gas emissions. The centre will conduct research in this area and deliver practical solutions to its partners and their networks as well as developing future leaders with business skills and deep technical knowledge.

Academic partners include: University of Cambridge, Cranfield University, Loughborough University, and Imperial College London. Key industrial partners include Adnams, Toyota Europe, Carbon Trust, Unilever, IBM, Vitsoe, Marks and Spencer, GM, Riversimple, EEF, IEMA, WRAP, Shearline and TUC.

The centre's work is structured around three themes: 1. Eco-efficiency: reducing resource use now; 2. Eco-factory: to develop tomorrow's eco-factory; 3. Sustainable Industrial Systems: to help shape industry for a 2050 future. The centre aims to create a transparent, collaborative global community for research to enable industry to become more sustainable. The plan is to expand to 88 PhD students in 5 years.

If you are interested in collaboration or research exchanges, please contact Prof. Steve Evans at se321@cam.ac.uk

South Australia's Approach to Encouraging Resource Efficiency

The South Australian Government's Eco-Innovation Program is unique in Australia. The \$3 million Program is encouraging local businesses to work collaboratively to develop innovative solutions that promote resource efficiency and a more sustainable approach to manufacturing.

The Program provides companies with information, tools and techniques, research, education and funding assistance to address barriers to efficiency improvements - within companies, sectors and supply chains. It also supports establishing precincts focussing on industrial symbiosis and collaborative resource use.

The Program complements a number of the South Australian Government's other environmental objectives such as greenhouse gas reduction, water and energy conservation and waste reduction.

For more information email: phillip.michael@sa.gov.au or visit www.southaustralia.biz

IE News from Around the World

Serious Greenhouse-Gas Accounting Error Related to Bioenergy Identified

The Scientific Committee of the European Environment Agency (EEA) unanimously passed an opinion calling for 'a major revision of EU policies and directives related to bioenergy.' Major international efforts are under way to replace fossil energy with biomass in order to reduce greenhouse gas (GHG) emissions. Several EU directives encourage bioenergy use based on the premise that biomass combustion would not add CO₂ to the atmosphere.

According to an opinion passed by the Scientific Committee of the EEA, "[t]his mistaken assumption results in a serious accounting error (see: <http://www.eea.europa.eu/about-us/governance/-scientific-committee/sc-opinions/opinions-on-scientific-issues/sc-opinion-on-greenhouse-gas>).

It is widely assumed that biomass combustion would be inherently 'carbon neutral' because it only releases carbon taken from the atmosphere during plant growth. However, this assumption is not correct and results in a form of double-counting, as it ignores the fact that using land to produce plants for energy typically means that this land is not producing plants for other purposes, including carbon otherwise sequestered. Present EU rules do not properly account for indirect land use change in the context of bioenergy policies and do therefore not consider the full GHG effects of bioenergy.

Online Global Materials Extraction 1900-2009

Growth in global materials use, GDP and population during the 20th century: Online global materials extraction 1900-2009 dataset has been extended and updated in 2011.

The dataset contains data on global materials extraction and primary energy consumption for the period 1900 to 2009 by main material groups. Mass flows are provided for biomass, fossil energy carriers, ores and industrial minerals and construction minerals. Data are presented as global totals (1000t), per capita of global population (t/cap/yr) and per unit of global GDP (t/\$ 1990 intl. \$/yr).

Quote data as: Krausmann, F., Gingrich, S., Eisenmenger, N., Erb, K.H., Haberl, H., Fischer-Kowalski, M. Growth in global materials use, GDP and population during the 20th century. *Ecological Economics* 2009 (in press: doi:10.1016/j.ecolecon.2009.05.007).

Data download: <http://www.uni-klu.ac.at/socec/inhalt/3133.htm>

New Interaction Platform for Industrial Ecology – Knowtheflow.com

The analysis of material and energy flows is not only ifu Hamburg's profession but also their passion. Due to the historical background of the company it has always been ifu's motivation to be an active driver for enabling the exchange of experiences in and best practices of projects among the community of industrial ecology. An important communication platform has now been added. The new blog [knowtheflow.com](http://www.knowtheflow.com) focusses on professionals from science, technology and economy who actively participate in the discussion on challenges and chances of environmental questions.

The initiators emphasize that the blog goes beyond providing information as it contributes knowledge via interaction. To participate in this interaction visit: www.knowtheflow.com.

ISIE News from Around the World

ISA team at the University of Sydney receives the highest science award in Australia for work in Industrial Ecology

Professor Manfred Lenzen, Dr Christopher Dey and Dr Joy Murray, from the University of Sydney in Australia, have jointly won the Eureka Prize for Innovative Solutions to Climate Change. Presented annually by the Australian Museum, the Eureka Prizes, known as the 'Oscars' of the Australian science world, reward excellence in the fields of scientific research and innovation, science leadership, school science and science journalism and communication.

Prof Lenzen, Dr Dey, and Dr Murray lead the Integrated Sustainability Analysis (ISA) team, a multi-disciplinary research group that has developed techniques to improve the way we calculate the environmental cost of what we produce, buy and eat. The work of the ISA team involves adapting economic input-output analysis to Industrial Ecology, in order to estimate the impacts of products, households, cities, regions and countries on our natural environment (see <http://onlinelibrary.wiley.com/doi/10.1111/j.1530-9290.2009.00190.x/pdf>). The team specialises in global, multi-region input-output analysis, and by using mathematics, large-scale data processing, and high performance computing, is able to trace environmental impacts along international supply chains.

For more information:

<http://eureka.australianmuseum.net.au/2D941DB0-77C1-11E0-A87E005056B06558?DISPLAYENTRY=true>.

Davos World Resources Forum Calls for Immediate Action to Double Global Resource Efficiency

World Resources Forum, Davos, September 19-21, 2011

Shaping the Future of Natural Resources - Towards a Green Economy,
The World Resources Forum (WRF) is a science-based platform to exchange knowledge about the economic, political and environmental implications of global resource use. WRF promotes innovation for resource productivity by building bridges between researchers and policymakers, business, NGO's and the public. Flagship activity is the bi-annual conference, held in Davos, Switzerland.

Marina Fischer-Kowalski gave a plenary talk on "Sociometabolic regimes, revolutions and transitions."

For more information: <http://www.worldresourcesforum.org/>

Training Programs: The 3rd International Training Course on Industrial Ecology and Environment

Eco-IRCT organized the 3rd International Training Course on Industrial Ecology and Environment hosted at Faculty of Environment and Resource Studies, Mahidol University, Thailand

The Eco-Industry Research and Training Center incorporated with Faculty of Environment and Resource Studies, Mahidol University, Thailand organized the 3rd International Training Course on Industrial Ecology and Environment during July 4-22, 2011, which was sponsored by the Colombo Plan Secretariat and the Thailand International Development Cooperation Agency. The training course was designed to provide an understanding of the principles concept and practice of industrial ecology, which had a benefits to the environment and can apply directly to the sustainable development of industrial sectors in Asia. There are 14 participants from 9 participating countries in South Asia, Southeast Asia, and the Middle East, such as Myanmar, Malaysia, Pakistan, Nepal, Sri Lanka, Fiji Island, Bhutan, Bangladesh, and Thailand. The training course involves basic concepts and principles in industrial ecology and environment including intensive academic and practical training as well as the opportunity for participants to learn and share experiences between countries. The overall structure of the recently training program was modified. Problem Based Training (PBT) was first applied as a main idea for designing the course structure, in order to provide a sharing of experiences breakthrough knowledge. The training program structure was framed into 3 modules, which are in class learning (Input), field study (learning by doing: Process), and group discussion (analysis and synthesis: Output).

The participants were given a lecture by various resource persons from Thailand and abroad. The lecture topics including in this module covered the basic principle of industrial ecology, life cycle thinking and assessment, eco-industrial park, emission reduction mechanism, and management tools for industrial ecology such as eco-efficiency, environmental standard: ISO 14000. We also invited the special guest lecture from the De La Salle University, Philippines, Prof. Anthony SF Chiu, who is the secretary of ISIE and president of Asia Pacific Round Table for Sustainable Consumption and Production, to give the lecture on the topic of introduction of industrial ecology and case study for 12 hours. Dr. Kitikorn Charmondusit, Director of the Eco-IRCT, was also gave the lecture on the topic of Eco-Efficiency and its applications. The project study, which aims to provide knowledge learning by field site study, was delivered using a problem-based training idea, which is a strategy that uses a problematic stimulus for participants to develop, acquire knowledge, and presented with a problem to solve rather than a lecture to absorb. The area nearby the Northern Region Industrial Estate (NRIE) in Lumphun province, north of Thailand was selected to be as the focused area for project investigation.

In conclusion, the international training course on Industrial Ecology and Environment involves academic lectures, field trip, and group discussion. It is our expectation that participants will immensely gain a lot of knowledge and practice from the course content and further develop their education on the industrial ecology and environment in their respective countries.



Postgraduate School of Industrial Ecology at NTNU

For the third time, the Postgraduate School of Industrial Ecology at NTNU offered PhD students the opportunity to get introduced to the latest advances in life-cycle assessment. During the two weeks from October 3 to 14, the participants were presented with core concepts in life-cycle assessment, such as input-output analysis, hybrid assessment and life-cycle impact assessment. During the first week, Prof. Edgar Hertwich, from NTNU in Trondheim (Norway), taught the modeling of product systems as well as methodological issues in life-cycle assessment: allocation, attributional vs. consequential LCA and recycling approaches. Prof. Mark Huijbregts, from Radboud University Nijmegen in the Netherlands, took over for the second week during which the students were introduced to life-cycle impact assessment and the cause-effect-damage chain of environmental systems. Key methodological aspects that were addressed throughout this second week include deriving impact- or damage-oriented characterization factors, uncertainty, use of up-to-date methods (ReCiPe and USETox) and policy-relevancy of life-cycle assessment.

Participants come from a very wide range of universities, research institutes and companies around the world. From agriculture to information technology, from India to Japan, these students have diverse backgrounds, with environmental impact assessment as a common field. In the light of life-cycle assessment, this multidisciplinary environment often leads to intense and interesting discussions. The number of participants is intentionally limited to facilitate these interactions.



Lecture Series: "Managing Complex Systems - Detecting and Averting Critical States"

This winter the University of Bremen will host a (partly international) lecture series at around the topic of "Managing complex systems - Detecting and averting critical states". There will be one lecture each Monday (12-14) between Oct 31 and Feb 13. Many, but not all, lectures will be in English and all of them are open to the public. The sessions will be videotaped and become available on the university's website. I attach the list of lectures and let you decide if this is worthwhile a short message in the newsletter.

Link to the lecture series' description (currently only on German): can be found at:
<http://www.tecdesign.uni-bremen.de/typo3/lehre/vorlesungen-wise/umgang-mit-komplexen-systemen.html>

The final videos and slides will be posted here: <http://mlecture.uni-bremen.de/ml/>

The Sixth National Recycling Economy and Ecological Industrial Academic Forum China Ecological Economic Association Industrial Ecology Economic and Technical Committee 2011: Annual Meeting Summary

On August 12th -14th, 2011, "The Sixth National Recycling Economy and Ecological Industrial Academic Forum - China Ecological Economic Association Industrial Ecology Economic and Technical Committee 2011 Annual Meeting" was held in Shanxi, China.

The theme of the meeting was "Resources • Recycling • Low-Carbon • Green • Sustainable Development", with the following objectives: to combine the present state for vital promotion of the circular economy and its development, promote of sustainable development, provide as the exchange and discussion platform for experts, discuss in depth China's establishment of Industrial Ecology, promote issues that needs to be resolved in low-carbon economy and building ecological civilization, actively explore for sustainable development, provide some reference for the Eco-Industrial development and ecological civilization construction.

Professor Teng Teng, Chairman of China Society of Ecological Economy, was the honorary chairman of the assembly. Four executive chairmen who attended the event were Jin Yong (Academician of China Academy of Engineering), Xu Delong (Academician of China Academy of Engineering), Guo Guichun (President of Shanxi University) and Feng Gaiduo (Mayor of Shouzhou City Government). There were 11 domestic and foreign experts invited to report in the assembly, whom of which were from the United States, Japan, China and other countries. There are total of 49 participating units, 141 people who attended the assembly.

At the meeting, Jin Yong pointed out the necessity of setting up cross-disciplinary, according to China's national conditions, can set up professional ways for "Resource Recycling Science & Engineering". Xu Delong suggested that there's too much load for the current environment, the energy resources are difficult to support sustainable development. Therefore, there is an urgent need for new eco-building materials industry and adherence to develop the new high-performance low-carbon eco-building materials.

Professor Hu Shanying analyzed that China Coal Chemical Eco-Industry System was superior to the existing structure. It will be an important direction in the future evolution for the Coal Chemical Industry. Professor Shi Lei brief introduced the ISIE2011, wherein he mentioned the issue of the industrial symbiosis and point out the research needs for Eco-Industrial Park and the industrial symbiosis. Professor Shi Han point out some ideas for the China's Eco-Industrial park planning. Professor Wang Xuming introduced some new energy technology inventions. He also provided some new technologies and ways for recycling resources. Professor Yamazaki mentioned that humans cannot survive independently. It is everybody's responsibility to protect the environment and construct the ecological civilization. Professor Helen Huiru Lou introduced the systems integration technology that can be applied in energy saving. Researcher Wang Tao pointed out that the development of circular economy is necessary to maintain the re-balancing of the cycle of natural biological systems. Director Zhao Yi explained the importance of the development of circular economy in Shanxi. Assistant of the mayor Chen Jin explained the development of circular economy in Shouzhou.

ISRS 8th Annual Conference in San Francisco, CA (June 5-6, 2011)

Reassessing the Basics of Industrial Symbiosis

The 8th Annual Industrial Symbiosis Research Symposium met on June 5-6 just prior to the ISIE Biennial Conference. The premise of this year's Symposium was to reflect on the development of the concept of industrial symbiosis over many years since our first meetings. In earlier times, the most important issue was to demonstrate the concept and practice of industrial symbiosis. With increasing experience, it is time to generalize among industrial symbiosis projects to compare them as a means of advancing our common knowledge as a research community.

About 50 industrial ecologists from across the globe gathered in downtown San Francisco, this past summer at the lovely (and green) Bentley Reserve in the heart of the financial district to discuss the workings of industrial symbiosis. Attendance was organized by team, and each team answered a battery of questions ahead of time. The teams were organized as follows:

- | | |
|--------------------------------|---|
| 1. Tsinghua China + | Led by Prof Shi Lei |
| 2. EU Consortium | Led by Profs Leo Baas and Frank Boons |
| 3. KSIE Korea + | Led by Prof Hung Suck Park |
| 4. International Practitioners | Led by Peter Lowitt, Chair of ISIE IS-EID Section |
| 5. Kalundborg + | Led by Jorgen Christensen |
| 6. NIES Japan + | Led by Prof Tsuyoshi Fujita |
| 7. Yale USA + | Led by Prof Marian Chertow |

The conversation started by focusing on the fundamental question of definition: What gets included in IS vs. what gets excluded? Symposium organizers wanted to know, are different research teams defining IS differently? As it happens, they are. A specific example of how IS is conceptualized differently among industrial ecologists became clear when teams proposed their preferred methods of categorizing by-product exchanges. The terms 'sharing', 'transfers', and 'exchange' all had seemingly different connotations initially. In the minds of some teams, differences in these terms depend primarily on whether an industrial output is classified as 'waste' by a regulatory body or not, and whether or not money is part of the transaction. Teams also had different perspectives on how many participants, materials, and number of exchanges must be counted in a network for it to constitute industrial symbiosis. The symposium continued on the question of how benefits should be quantified. Responses were more uniform in agreeing that economic, environmental, and social factors must each be given weight. A combination of tools such as MFA, LCA, and GIS were noted as key measurement methodologies, but many participants voiced a need for better consideration of the social impacts. Measurement of material flows, a strength of industrial ecologists, can be quantified in terms of changes from previously existing conditions (in the case of new IS), or versus business-as-usual in the case of existing, or uncovered, IS.

A number of different business models for facilitating industrial symbiosis were shared, reflecting the diversity of governments and industry in which IS is taking place today. Some models (Kalundborg, USA, NISP) are more spontaneously conceived as compared to more government-oriented models (Korea, Japan, China).

In the end, while much had been debated and discussed, there was agreement that further exploration of these key questions should be pursued at the upcoming 9th Annual ISRS Conference at TEDA in the fall of 2012. In the meantime, Profs. Boons and Chertow are leading the drafting of a meeting summary.

LCA XI Conference: Instruments for Green Futures Markets by Briana Niblick, Cassandra Thiel, Bill Collinge, Kullapa Soratana

LCA XI was held at Chicago's Navy Pier from October 4 to 6, 2011. Ten classes plus the LCACP certification exam were offered on October 3. The conference was organized into four parallel tracks with a total of 42 sessions (180 presentations), in addition to a poster session. As a new feature this year, presenters could write and submit papers based on their presentations to be published as part of the conference proceedings.

This year 315 people attended the conference, a slight increase from 300 people in 2010. Approximately one third of the attendees came from academia, one third from industry and the remaining from consultancies (15%), government (10%), and non-profit organizations (5%).

The conference began with a plenary session featuring Farzad Taheripour, who spoke about land use emissions of biofuels. Several sessions elaborated on topics of biofuels, bio-based products, and land use. Discussion around land use focused on an evaluation of currently available LCI and LCIA methods, the latter of which tended to focus on impacts to biodiversity and ecosystem services. Several sessions dealt with building analyses, such as how to make whole-building LCA useful to decision-makers in the architecture, engineering and construction sectors. Other parallel sessions included transportation, power, electronics, agriculture, statistics, monetization, policy, and education.

Special sessions were convened on the topics of product category rules (PCRs), sustainability measurement and reporting, and land use developments of the UNEP-SETAC Initiative. In addition, the USDA launched the LCA Digital Commons project, which provides a platform for transparent, open-access life-cycle databases and tools. (See <http://www.lcacommons.gov>.)

To learn how you can contribute to next year's conference, be sure to register for the ACLCA e-newsletter and listserv at <http://lcacenter.org/eletter>.

APBITMS Panel Discussion on EIP in University of Lausanne

The Asia Pacific Business Innovation and Technology Management Society recently held an International European Conference in the University of Lausanne last October 2nd – 4th, 2011 in the University of Lausanne. In the event, a panel discussion on Eco-Industrial Park took place which was facilitated by Professor Suren Erkman and Professor Anthony SF Chiu.

The panel deliberated on EIP issues in Asia and Europe specifically projects in India and Vietnam. EIP developmental models and data-bank management were presented and discussed among participants from Italy, United Kingdom, Iran, Philippines, Taiwan, Japan & Indonesia.



The XI International Congress on Solid Waste Disposal, Summary by Cheng Huiqiang

The XI International Congress on Solid Waste Disposal and Environmental Perspectives, which was held in the city of Pereira, Colombia from August 24 through 26, 2011.

The Congress is aimed to: 1) Know the state of the art of Integral Waste Management; 2) Promote the dissemination and exchange of waste management technologies; 3) Analyze the current situation of the Integral Solid Waste Management and Environmental Perspectives with an emphasis on management, use and disposal topics; 4) Exchange local, national and international successful experiences on waste management and disposal; 5) Offer through the presentations legal requirements associated to the trash collection services; 6) Generate direct contact scenarios for the establishment of business strategies between generators and waste managers; 7) Contribute to the strengthening of institutional capacities of municipalities and social organizations for the environmental management with emphasis on the topic.

More than 500 people including researchers, scholars, managers, governors, comptrollers, superintendents and public and private sector attended the congress. As the only representative of Asia, Prof Cheng Huiqiang, executive director of Industrial Ecological Economy and Technical Committee of Chinese Ecological Economy Society (CEES), delivered a speech about Policies and technologies of resources recycling in the congress.



Upcoming Conferences

- Environmental & Integrated assessment of Complex Systems Conference. Nov 30– Dec 2, 2011. France, Montpellier <http://www.ecotech-tools.org/>
- 2nd New Zealand Life Cycle Assessment conference, Auckland, New Zealand, 28-29 March, 2012 <http://www.lcaconference.org.nz/>
- Technoport conference, 16-18 April 2012 in Trondheim, Norway, <http://technoport.no/conference-2012/>
- Gordon Research Conference on Industrial Ecology- Les Diablerets, Switzerland, June 17-22, 2012
- Third International Engineering Systems Symposium CESUN June 18-20, 2012, Delft, The Netherlands cesun2012.tudelft.nl
- 18th Annual International Sustainable Development Research Conference, 24-26 June 2012, Hull, UK www.hull.ac.uk/isdrc18
- OSCP section first workshop in Rotterdam, Netherlands, June 15-16, 2012
- ECOS 2012, Renewable Energy Conversion Systems and Sustainable Technologies. , June 26-29, 2012, Perugia, Italy <http://www.ecos2012.unipg.it>
- International Symposium on "Life Cycle Analysis and Construction", Nantes, France 10-12 July 2012 <http://lca-construction2012.ifsttar.fr>
- ISIE Asia Pacific conference in Beijing, Sept 9-10, 2012
- The 9th Industrial Symbiosis Research Symposium in Tianjin, Sept 8, 2012
- MFA Section Workshop in Darmstadt, Germany, Sept 2012
- The 18th Greening of Industry Network (GIN) Conference, Sweden, 22 - 24 October, 2012 www.greeningofindustry.org
- Baltic Inert Material Management Symposium (BIMMS), November 21 and 22, 2012, Stockholm, Sweden www.bimms.org

Upcoming Gordon Research Conference (GRC) on Industrial Ecology

Gordon Research Conference (GRC) on Industrial Ecology

June 17-22, 2012; Les Diablerets Conference Center, Les Diablerets, Switzerland

The 2012 GRC on Industrial Ecology will examine key sustainability imperatives from various angles, exploring how industrial ecology helps address some of the key interconnected questions that the planet is facing. The application deadline is **May 20, 2012**. Please apply early, as the meeting may become over-subscribed. For more information or to apply:

<http://www.grc.org/programs.aspx?year=2012&program=industeco>

Gordon Research Seminar (GRS) on Industrial Ecology

Held in conjunction with the GRC on Industrial Ecology.

June 16-17, 2012; Les Diablerets Conference Center, Les Diablerets, Switzerland

The focus of this meeting is on industrial ecology as it relates to the challenges of sustainable development - namely the efficacy of current tools and methodologies at reliably disclosing and assessing the interplay between environmental impacts and economic activities.

The application deadline is **May 19, 2012**. Speakers will be selected from abstracts submitted by **February 16, 2012**. For more information or to apply:

http://www.grc.org/programs.aspx?year=2012&program=grs_indust

Call for Abstracts— SETAC Europe 22nd Annual Meeting

The theme for the SETAC Europe 22nd Annual Meeting is "Securing a sustainable future: integrating science, policy and people". Abstracts can be submitted online at <http://berlin.setac.eu/siteview/?contentid=494>.

The deadline to submit abstracts is **30 November 2011**.

Session Title: E06 - Increasing scientific and policy understanding through meta-analysis of life cycle assessments (under **main theme: E - Life cycle assessment (LCA) and life cycle management (LCM)**)

Description: The body of life cycle assessment (LCA) literature is vast and has grown over the last decade at a dauntingly rapid rate. Many LCAs have been published on the same or very similar technologies or products, in some cases leading to hundreds of publications. One result is the impression among decision-makers that LCAs are inconclusive owing to perceived and real variability in published estimates of life cycle impacts. Despite the extensive available literature and policy need for more conclusive assessments, only modest attempts have been made to synthesize previous research. A significant challenge to doing so are differences in the technologies considered throughout the life cycle and inconsistencies in methodological choices (e.g. system boundaries, co-product allocation and impact assessment methods) among the studies that hamper easy comparisons and related decision support. An emerging trend in LCA is for meta-analysis, which have the potential to clarify the impacts of a particular technology, process, product, or material, and produce more robust and policy-relevant results. Meta-analysis is defined here as analysis of a set of published LCA results, either in a statistical sense (e.g., following the practice in the biomedical sciences), or by quantitative adjustment of the underlying studies to make them more methodologically consistent. One example of the latter approach was published by Farrell and colleagues in Science in 2006 clarifying the net energy and GHG emissions of ethanol.

New Report: Compelling Case for Asia Pacific's Transition to Green Economy, By Heinz Schandl

A new 'green' industrial revolution is needed in the Asia-Pacific region that catalyses dramatic improvements in resource efficiency if the countries and communities there are to prosper in the twenty first century.

A report - *Resource Efficiency-Economics and Outlook for Asia and the Pacific* - was released in Beijing, Canberra, New Delhi, and Tokyo in September 2011 that estimates per capita resource consumption of 'materials' in the region, such as construction minerals and fuels, needs to be around 80 per cent less than today to achieve sustainable development.

Prepared by the United Nations Environment Programme (UNEP) and partners - and led by Heinz Schandl from CSIRO - the report says Asia Pacific's dynamic growth of the past few decades has reduced poverty and increased wealth and per capita incomes. But that has come at a price of a high - current and future-environmental cost. Problems include pollution including greenhouse gas emissions, biodiversity loss, deteriorating ecosystems and rapid resource depletion'. Total materials consumed in 2005 alone, including biomass, fossil fuels, metals and industrial and construction materials, amounted to around 32 billion tonnes according to the report. Without a decoupling of gross domestic product (GDP) growth from resource use, Asia Pacific is likely to be using 80 billion tonnes materials by 2050.

Asia Pacific currently accounts for more than half of the world's total resource use; in large part because it also accounts for over half the world's population and nearly 30 per cent of the world's GDP.

Many countries in Asia and the Pacific have recognised the need for policies that help enhance resource efficiency and guide their economies into a sustainable future by innovating the way food, housing, mobility and transport, energy and water are provisioned.

The significance of this work is that for the first time we have really good information across more than 3 decades about the resource economies in the Asia Pacific region.

The report can be downloaded from <http://www.unep.org/roap/>

New Book: Can We TECHNO-FIX Our Way to Sustainability?

Techno-Fix: Why Technology Won't Save Us or the Environment, by Michael Huesemann, Ph.D., and Joyce Huesemann, Ph.D., (foreword by Paul and Anne Ehrlich, and endorsements by Herman Daly, Norman Myers, E.U. von Weizsaecker, William Rees, and others) questions a primary paradigm of our age: that advanced technology alone will extricate us from an ever increasing load of social, environmental, and economic ills. *Techno-Fix* shows why negative unintended consequences of science and technology are inherently unavoidable and unpredictable, why counter-technologies, techno-fixes, and efficiency improvements do not offer lasting solutions, and why modern technology, in the presence of continued economic growth, does not promote sustainability but instead hastens collapse.

Techno-Fix asserts that major paradigm shifts are needed to reorient science and technology in a more socially responsible and environmentally sustainable direction. The arguments advanced in *Techno-Fix* are supported by extensive research, with more than 1200 footnotes citing at least 600 references, primarily from peer-reviewed academic publications. To view the advance praise, table of contents, introduction, and to receive a set of free PowerPoint lectures to facilitate classroom presentations of the topics covered in *Techno-Fix*, please visit www.technofix.org.

ISIE Members News

Ryan M. Bright has successfully defended his thesis entitled "Environmental systems analysis of road transportation based on boreal forest biofuel: Case studies and scenarios for Nordic Europe" at The Industrial Ecology Programme at Norwegian University of Science and Technology (NTNU). He will now start as a full time researcher at NTNU working with climate impact of increased forest harvesting in Norway.

Sunita Prugsamatz has joined the Industrial Ecology Programme at Norwegian University of Science and Technology (NTNU). She holds a PhD from University of Queensland, Australia, and will contribute to strengthening the research on consumer psychology and applied consumer behavior. In particular she will be working to develop a theoretically derived and tested toolbox of tailored psychological intervention techniques to reduce climate emissions of Norwegian households.

Grants and Awards

PhD Candidate Erinn G. Ryen from the Rochester Institute of Technology (RIT)'s Golisano Institute for Sustainability won the 2011 US EPA Science To Achieve Results (STAR) Graduate Fellowship. This fellowship will fund her research to develop new metaphors and models in industrial ecology based on fundamental principles of community ecology borrowed from biological systems. Specifically, this project investigates how materials and products of environmental importance are structured at the community scale and managed with respect to environmental goals. Erinn is working under the guidance of Dr. Callie Babbitt.

Anu Ramaswami at University of Colorado Denver with co-PIs Marian Chertow (Yale), Larry Baker (U of Minnesota), Larry Bank (City College New York), and Paty Romero-Lankao (National Center for Atmospheric Research) have been awarded a \$750,000 NSF Research Collaboration Network grant on Sustainable Cities. This grant seeks to develop harmonized methods, open datasets and shared curriculum on the topic of sustainable cities across 20 US universities. A unique aspect of this RCN is broad-based inter-disciplinary integration toward the goal of sustainable cities. This new RCN will be managed via UC Denver's Center for Sustainable Infrastructure Systems (CSIS) with a steering committee of Co-PI and several faculty from the ISIE community, including Scott Matthews (CMU), John Fernandez (MIT), Clint Andrews (Rutgers), Eric Williams (RIT), Helga Weisz (PIK) and others.

Dr. Anthony Halog, an Assistant Professor at the University of Maine in Industrial Ecology, LCA and Systems Sustainability, and a former awardee of competitive **Japan Society for the Promotion of Science (JSPS) Postdoctoral Fellowships** at the National Institute of Advanced Industrial Science and Technology (AIST), has been recently awarded a JSPS Bridge Fellowship to re-visit Japan. The main purpose of his research visit is *to create and strengthen interdisciplinary, international scientific networks for collaborative research activities in developing novel, innovative and effective global environmental and sustainable development strategies to reduce global*

We would like to hear from YOU!

The ISIE newsletter is published four times a year. The aim of the newsletter is to keep our members informed about the latest and greatest ISIE news from around the globe.

We can only do it with your help!

Please send us any information you think is worth including in the newsletter and we will find a place for that (conference summary, important publications, job posting, new appointments, etc.).

Please email your contributions to vered@industrialecology.org.il

Open Positions

Senior Pollution Prevention Engineer, New York State Pollution Prevention Institute (NYSP21)

Application information and any relevant documentation such as a resume and cover letter should be uploaded to this website <http://mycareer.rit.edu> in order to be considered for this position.

For more information contact:
Anahita Williamson, aawasp@rit.edu

The research training group (RTG) 1703 "Resource Efficiency in Corporate Networks – Methods for Enterprise and Corporate Level Planning to Utilize Renewable Resources" (Speaker: Prof. Dr Jutta Geldermann) offers

**12 PhD positions
(75% E 13 TV-L; 3 years)**

from 1 April 2012. The RTG is supported by the German Research Foundation (DFG) and is located at the Georg-August-University Goettingen. Involved disciplines are: Forestry, Agricultural Sciences, Mathematics, Business Information Systems and Economics. Dissertations are possible in the research areas: materials and technology (A), planning of production and supply chains for renewable resources (B), and governance, coordination and distribution (C). Further information and the application platform are available at www.resource-efficiency.uni-goettingen.de. Please apply before 5 January 2012.

Post-Doctoral Positions Available, Regional and Global Modeling of Combined Eco-System and Economic Scenarios

Two grants from the U.S. National Science Foundation support the economic component of interdisciplinary research on the interactions between consumption and production activities on the one hand and eco-system services on the other. Eligible candidates will have a recent Ph.D. in economics or a related field with a focus on ecological economics, resource economics, or regional policy analysis. The applicant should possess excellent verbal and written communication skills for working as part of an interdisciplinary team.

Experience with modeling is required, especially with input-output models and databases of the economy for environmental applications; experience with GIS is desirable. Send curriculum vitae, statement of research interests, and contact information for three references to Professor Faye Duchin (duchin@rpi.edu), Department of Economics, Rensselaer Polytechnic Institute, Troy, NY USA. Search will continue until positions are filled.

More Positions Are Available at:

<http://www.is4ie.org/jobs>

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International Society for Industrial Ecology

The International Society of Industrial Ecology (ISIE) promotes industrial ecology as a way of finding innovative solutions to complicated environmental problems and facilitates communication among scientists, engineers, policy makers, managers and others who are interested in how environmental concerns and economic activities can be better integrated.

Next ISIE Newsletter Schedule

<u>Publication Date</u>	<u>Submission Date</u>
January 31, 2012	January 10, 2012
April 30, 2012	April 10, 2012
July 31, 2012	July 10, 2012

ISIE Membership Information

Check us out on [LinkedIn](#) and [Facebook](#)!

Visit our website (<http://www.is4ie.org>) to connect with other members of the ISIE community, update your profile, access the JIE electronically, join the conversation in the discussion forums and much more.

To access the Members Only pages, visit www.is4ie.org/membersonly

Consider joining one of the ISIE Subject Sections as part of your membership. The ISIE now hosts six topical sections:

- Material Flow Analysis - ConAccount
- Life Cycle Sustainability Assessment
- Eco-Industrial Development
- Environmentally Extended Input Output
- Sustainable Urban Systems
- Organizing Sustainable Consumption and Production

Information about each section can be found at <http://www.is4ie.org/topicalsections> Subject sections are open only to members of the Society. Join as many of these sections as you would like.

To join a section, sign in to the Members Only pages and click the link to "View Profile". You will see a section within your profile to choose which sections you would like to join. You will then be included on correspondence within that section.
