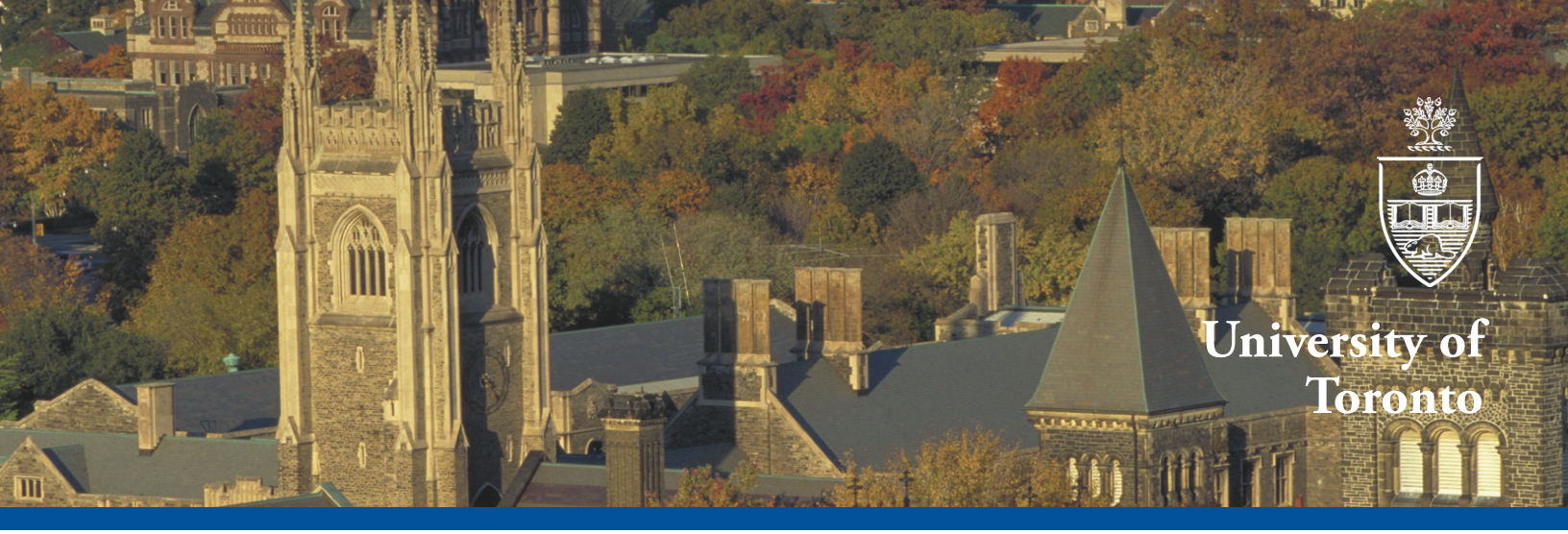

The 4th International Conference of the
International Society for Industrial Ecology, ISIE
June 17-20, 2007

Program

Industrial Ecology for a Sustainable Future

University of Toronto,
Toronto, Canada

International Society
for Industrial Ecology

International Society for Industrial Ecology

Industrial Ecology for a Sustainable Future, ISIE 2007

The 2007 Conference represents a significant move for the International Society for Industrial Ecology to expand the range of topics and themes beyond those at our previous conferences. Responding to calls from our membership and others, social science becomes a full partner with our more traditional technical perspectives. Sustainability takes on an explicit presence. Further, our themes reflect the globalizing process requiring that industrial ecology reflect a broad diversity in social and economic conditions. Consumption, which has been present, but in the background, emerges to broaden our historic focus on products and production.

These evolutionary changes lead to a profusion of paper topics as we simultaneously move to expand our boundaries to maintain and increase the relevance of our field while continuing to deepen its foundations. The Chairs and Technical Committee promise to produce a coherent and exciting program that marries the old and the new.

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CONFERENCE THEMES

A: Sustainable Social Metabolism

Underlying unsustainable development are huge amounts, and specific qualities, of materials and energy used by contemporary industrial production and consumption systems. Analyzing this social metabolism at different levels and finding ways to reorient it towards more sustainable paths has been a major topic in industrial ecology since its beginning. Latest developments in analytical methods such as material flow analysis, life cycle analysis, input-output analysis and possible links between them, are presented. Attention is also given to critical and upcoming issues, including future energy systems, climate change, sustainable water metabolism, and resource scarcity.

B: Infrastructure for Sustainable Cities

With close to half the world's population living in cities, the design of urban infrastructure may hold the key to a sustainable future. Sessions focus on areas of water, energy, waste management, buildings and neighbourhoods. Sessions on regional metabolism include papers ranging from sustainable transportation to urban vegetation.

C: IE for Developing Countries

Developing countries face different issues to the developed world, suggesting different focus in the applications of IE. Issues addressed include transitions from agrarian to industrial economies; the future of water metabolism; and environmental impacts of world trade.

D: Transition to Sustainability in a Complex World

This theme brings transition management and complex systems theory together with other latest thinking on sustainability to point to some possible future directions for the discipline of IE. Sessions include integrated assessment, complex systems, thermodynamics and transition to sustainability.

E: Business and Management for IE

A crucial dimension to Industrial Ecology is that business must be competitive. This theme includes sessions on industrial symbiosis, business perspectives on waste management, supply chain management and other topics on Business and IE.

F: Technology and Engineering for IE

This theme presents innovations in energy technologies, manufacturing processes and eco-materials; and introduces a session on process systems engineering.

G: Education and Training

OVERVIEW OF PROGRAM

MS = Medical Sciences Auditorium
BA = Bahen Centre
GB = Galbraith Building
HH = Hart House; see map on inside cover

Sunday, June 17, 2007

9.30 a.m.	Opening Ceremony (MS)
10.00 a.m.	Plenary I: Sustainable Social Metabolism, Marina Fischer-Kowalski (MS)
10.50 a.m.	Refreshment Break (BA)
11.20 a.m.	Parallel Sessions (BA)
12.40 p.m.	Lunch (HH) / Student Chapter Meeting (GB 303)
2.00 p.m.	Parallel Sessions (BA)
3.20 p.m.	Refreshment Break (BA)
3.40 p.m.	Parallel Sessions (BA)
5.00 p.m.	Wrap-up Plenary: The IHDP-IT Program / OECD MFA Project (MS)
6.30 p.m.	Barbecue (HH) / Student Event

Monday, June 18, 2007

9.00 a.m.	Plenary II: Infrastructure for Sustainable Cities, Aromar Revi (MS)
10.00 a.m.	Parallel Sessions (BA)
11.00 a.m.	Refreshment Break (BA)
11.20 a.m.	Parallel Sessions (BA)
12.40 p.m.	Lunch (HH)
2.00 p.m.	Parallel Sessions (BA)
3.20 p.m.	Poster Session I, with refreshments (BA)
4.40 p.m.	Plenary Debate: What is the potential contribution of bio-energy in addressing climate change? (MS)
6.30 p.m.	Reception (Marriott Hotel, Eaton Centre)
7.00 p.m.	Dinner (Marriott Hotel, Eaton Centre)

Tuesday, June 19, 2007

9.00 a.m.	Plenary III: IE for Developing Countries, Yi Qian (MS)
10.00 a.m.	Parallel Sessions (BA, GB)
11.00 a.m.	Refreshment break (BA)
11.20 a.m.	Parallel Sessions (BA, GB)
12.40 p.m.	Lunch (HH) / Student chapter meeting (GB 303)
2.00 p.m.	Parallel Sessions (BA, GB)
3.20 p.m.	Poster Session II, with refreshments (BA)
4.40 p.m.	Plenary Debate: The Relevance of IE for the Developing World (MS)
7.00 p.m.	Boat Cruise (with dinner; board at 6.30 p.m.)

Wednesday, June 20, 2007

9.00 a.m.	Plenary IV: Transitions to Sustainability in a Complex World, Henry Regier (MS)
10.00 a.m.	Parallel Sessions (BA)
10.20 a.m.	Semi-plenary: The Role of Complexity in System-of-Systems Engineering, Daniel DeLaurentis (BA 1190)
11.00 a.m.	Refreshment Break (BA)
11.20 a.m.	Parallel Sessions (BA)
12.40 p.m.	Lunch (HH)
2.00 p.m.	Plenary Debate: Is IE Consistent With Sustainability? (MS)
3.00 p.m.	Closing ceremony; society awards; student competition presentation; ISIE members open meeting (MS)
4.00 p.m.	Finish

OVERVIEW OF PARALLEL SESSIONS

	BA 1160	BA 1170	BA 1180	BA 1190	BA 1200	BA 1230	GB 303
Sunday, June 17, 2007							
11:20 – 12:40	A5: Uncertainty in LCA/MFA	A14: Sustainable consumption (I)	B15: Sustainable cities and regional metabolism (I)	C23: MFA, LCA and EIO cases studies from developing countries	D27: Integrated sustainability assessment models (I)		
2:00 – 3:20	A2: Material flows and waste (I)	A14: Sustainable consumption (II)	B15: Sustainable cities and regional metabolism (II)	C22: Eco-industrial development in Asia (I)	D27: Integrated sustainability assessment models (II)		
3:40 – 5:00	A2: Material flows and waste (II)	A8: Sustainable manufacturing and cleaner production	B16: Sustainable urban water	C22: Eco-industrial development in Asia (II)	F35: Process systems engineering		
Monday, June 18, 2007							
10:00 – 11:00		A1: Material and substance flows on global, regional and national scales (I)	A9: Agriculture, forestry and land-use (I)	F33: Eco-materials and design for the environment	E30: Supply chain management	B17: Urban energy systems	
11:20 – 12:40		A6: Advances in input-output analysis for IE (I)	A10: Bio-energy	E29: Industrial symbiosis: Eco-industrial parks and networks (I)	E28: Business perspectives on waste management	B19: Sustainable buildings, neighbourhoods and materials (I)	
2:00 – 3:20		A6: Advances in input-output analysis for IE (II)	A11: Energy, carbon and economic growth	E29: Industrial symbiosis: Eco-industrial parks and networks (II)	E31: Business and IE	B19: Sustainable buildings, neighbourhoods and materials (II)	
Tuesday, June 19, 2007							
10:00 – 11:00		A1: Material and substance flows on global, regional and national scales (II)	A9: Agriculture, forestry and land-use (I)	C21: Sustainability issues in developing countries	F32: Energy technologies of the future		D26: Complex systems (I)
11:20 – 12:40		A13: Policy applications of IE (I)	A4: LCA (I)	C20: IE for developing countries (I)	B18: Urban waste management		D26: Complex systems (II)
2:00 – 3:20		A13: Policy applications of IE (II)	A4: LCA (II)	C20: IE for developing countries (II)	D24: IE and the transition to sustainability		E29: Industrial symbiosis: Eco-industrial parks and networks (III)
Wednesday, June 20, 2007							
10:00 – 11:00		A3: MFA concepts	A7: Stock accounting and the relationship between stocks and flows	D26: Complex systems (III)	D25: Thermodynamics and information theory for IE	F34: Innovations in manufacturing processes for reduced impacts (I)	
11:20 – 12:40		A12: Eco-efficiency	G36: Education and training	D26: Complex systems (IV)	D27: Integrated sustainability assessment models (III)	F34: Innovations in manufacturing processes for reduced impacts (II)	

DETAILED PROGRAM

Sunday, June 17, 2007

9:00 a.m.	Opening Ceremony: **Cristina Amon,** *Dean, Faculty of Applied Science and Engineering, University of Toronto*
10:00 a.m.	Plenary I: **Marina Fischer-Kowalski**, *Institute of Social Ecology, Vienna (Austria)* *Transition to a Sustainable Social Metabolism: Facing the Global Challenge* Most commonly, a transition towards more sustainable patterns of production and consumption, that is a more sustainable social metabolism, is equated with the problem of abolishing a highly wasteful industrial lifestyle. Globally speaking, this is an inadequate representation of the problem. At the time being, two thirds of the world's population are at various stages of achieving a transition towards acquiring exactly this wasteful industrial lifestyle, a much more dynamic transition that – as I will show empirically – has very much in common with the historical great transformation from an agrarian to an industrial socioecological regime Europe, North America and Japan went through in the past 100-250 years. Except that this transition now occurs under very different framework conditions than in the past: neither are there vast areas of land to be conquered, nor vast amounts of cheap fossil energy reserves, nor is there a seemingly unlimited absorption capacity for human wastes and emissions any more. From our recently established database on the biophysical characteristics of 165 countries across the past 100 years I will demonstrate what ongoing transition pathways can be distinguished. And I will try to make a convincing case out of my own conclusion that the key challenge for international sustainability science, and for industrial ecology in particular, consists in developing new infrastructures, and new material cycles, in other words a new industrial socio-ecological regime viable for the globe.
10:50 a.m.	Refreshment Break
11:20 a.m.	Parallel Sessions
12:40 p.m	Lunch (Hart House) / Student chapter meeting
2:00 p.m.	Parallel Sessions
3:20 p.m.	Refreshment Break
3:40 p.m.	Parallel Sessions
5:10 p.m.	Wrap-up Plenary; Chair: **Derry Allen**, *US. Environmental Protection Agency (USA)*
5:15 p.m.	**Yuichi Moriguchi**, *National Institute for Environmental Studies (Japan)* *The OECD MFA Project* An international group of Industrial Ecology researchers is close to achieving for national environmental accounting the equivalent of what Kuznets and others established for national economic accounting in the 1930s. Working with the OECD and several other national/ international organizations, the group is producing standardized guidelines for reporting national material and substance stocks and flows.
5:30 p.m.	**John Robinson**, *University of British Columbia (Canada)* *Industrial Transformation* Industrial Transformation (IT) is a core research project of the IHDP on Global Environmental Change. The objective of the IT research is to understand complex society-environment interactions, identify driving forces for change, and explore development trajectories that have significantly smaller burden on the environment. IT's operation can be characterised by two phases. First, 1999-2004, marked predominantly by a translation of a science plan into research, influencing research agendas, initiation of a small number of cases, with focus on production and consumption patterns in the energy, food and transport systems and with emphasis on industrialised countries. During that phase we have learnt that change towards sustainability involves more than technology alone and that it should be seen in the institutional and social contexts. Product and process innovations should be placed in the framework of socio-technical systems. For that reason such change is often conceptualized as system innovation. Many system innovations took place in the past and they can be characterised as multi-level, multi-actor, multi-dimensional, radical changes in the way societal needs are met. Their analysis helps in drawing conclusions about potential patterns of change and possible policy intervention points. In phase two, 2004-2009, we try to link this research on sustainability transitions in high-income countries with research on Asian development. We apply a system innovation framework to the analysis of sustainability transitions in Asia, which, from sustainability perspective is one of the most challenging regions in the world. The ambition is to speculate whether rapidly industrialising and urbanising Asia can follow a somewhat different pattern of development than that of industrialised societies. Focus is on environmental aspects of sustainability with analysis nested in the context of wider socio-ecological transformation.
6:00 p.m.	Break
6:30 p.m.	Barbecue (Hart House) / Student Event

Monday, June 18, 2007

9:00 a.m. Plenary II: **Aromar Revi**, *TARU, Delhi (India)*

Sustainable 'RUrban' Infrastructure

With a large fraction of the world's population living in cities, the conjoint design of RUrban ecosystems and infrastructure may hold the key to a sustainable future. This session will describe how the city of Greater Panjim (the capital of the state of Goa, India) and its embedding region could meet the multiple goals of strict form sustainability: combining greater equity and a higher quality of life, with a successful economy, sustainable levels of resource use and waste generation, over a 30 to 50 year period. The award winning Goa 2030 vision project demonstrated the feasibility of:

- RUrban design, where ecosystem design precedes the design of urban areas to ensure the sustainability of ecosystem services (food, biomass, water, renewable energy) and the integration of the rural and the urban, enabling improvements in quality of life and the practice of sustainable livelihoods;
- A mean energy consumption that can be contained to 1,500 Watts per person without compromising a "modern" lifestyle, but moderating it with convivial values and plain common sense;
- Using best practices and technologies to help 'optimise' urban morphology (height, density and covered area) and mobility systems, linked to the consolidation of urban areas into low-to-medium rise, high-density settlements.
- The financial and technical feasibility of a sustainability transition in the medium-run

It did this in the context of a three-year international collaborative process that brought together teams working on four regions: Greater Vancouver, Greater Shanghai, three Northern provinces in the Netherlands and Goa to develop a set of tools to bridge the space between current approaches to long-range urban, bioregional and energy planning and ecological and urban design.

Examples of multiple initiatives and catalyst projects from these regions and countries will be used to sketch the economic, technical, institutional and implementation challenges before a traverse from existing to future sustainable urban systems.

10:00 a.m. Parallel Sessions

11:00 a.m. Refreshment Break

11:20 a.m. Parallel Sessions

12:40 p.m Lunch (Hart House)

2:00 p.m. Parallel Sessions

3:20 p.m. Poster Session I, with refreshments

4:40 p.m. Plenary Debate:

What is the Potential Contribution of Bio-energy in Addressing Climate Change?

Chair: **Helga Weisz**, *Klagenfurt University (Austria)*
Participants:
Roland Clift, *Distinguished Professor of Environmental Technology and Founding Director of the Centre for Environmental Strategy at the University of Surrey. Member of the Science Advisory Council of the UK's Department of the Environment, Food and Rural Affairs*
Rattan Lal, *Director, Carbon Management and Sequestration Center, Ohio State University, President, Soil Science Society of America*
Heather MacLean, *Associate Professor, Department of Civil Engineering, University of Toronto*

Many governments are encouraging the development of biomass energy (e.g., from crops, forestry, waste) as a solution to an over reliance on fossil fuels and the issue of climate change. Are the net life-cycle carbon emissions from generating electricity, providing heat, or running transportation vehicles using high percentage biomass fuels lower than with conventional fossil fuels? What is the best use of biomass? Where is the best biomass and is there enough of it? Could reductions in CO2 equivalent emissions be significant enough to solve our energy crisis? What are the other considerations, e.g., competing technologies or provision of agricultural land for food?

6:30 p.m. Reception (Marriott Hotel, Eaton Centre)

7:00 p.m. Dinner (Marriott Hotel, Eaton Centre)
Presentation by **John Campbell**, *CEO of Waterfront Toronto, on the sustainable development of the Toronto Harbourfront*

Tuesday, June 19, 2007

9:00 a.m.	Plenary III: **Yi Qian**, *Tsinghua University (China)* *Industrial Ecology in China: A Critical Review* China has undergone unprecedented rapid economic development which brings great welfare and meanwhile serious challenges to management of natural resources and the environment. To cope with these challenges, China put forth the scientific development conception and takes a series of measures to implement the "circular economy". In this paper, a critical review of industrial ecology in China will be given through three aspects. The first is from the material flow analysis (MFA) perspective, the challenges brought by economic development on resources and environment are quantitatively described. The decoupling trends and rebound effect are also discussed. The second, the state-of-the-arts of industrial ecology in China are outlined. Along the mainstream from cleaner production to eco-industry then to circular economy, measures taken by enterprises and governments are summarized, and industrial ecology education in China is also introduced. In the last part, some of our key questions are presented, including: How much should industrial ecology be expected to contribute to China's sustainable development? What measures are most likely to be useful to improve both sustainable industrialization and sustainable consumption from an industrial ecology perspective? Which reforms are needed for industrial ecology education in China?
10:00 a.m.	Parallel Sessions
11:00 a.m.	Refreshment Break
11:20 a.m.	Parallel Sessions
12:40 p.m	Lunch (Hart House) / Student Chapter Meeting
2:00 p.m.	Parallel Sessions
3:20 p.m.	Poster Session II, with refreshments
4:40 p.m.	Plenary Debate: *Can Industrial Ecology Help Developing Countries Rapidly Change from Conventional to Sustainable Industrialization?* Chair: **Lei 'Spencer' Shi**, *Tsinghua University (China)* Participants **Anthony S.F. Chiu**, *Research Scientist, Center for Engineering and Sustainable Development Research, De la Salle University, Manila, (Philippines)* **Ramesh Ramaswamy**, *Resource Optimization Initiative (India)* **Xin Tong**, *Associate Professor, Department of Urban and Regional Planning, College of Environmental Sciences, Peking University (China)* **Sergio Pacca**, *Assistant Professor, School of Arts Sciences and Humanities, University of São Paulo (Brazil)* Realizing the negative impacts of conventional industrialization on the environment and society, many developing countries seek to implement strategies and measures from industrial ecology, e.g., eco-industrial parks, eco-towns and circular economy. These initiatives do improve economic growth and environmental performance; however, many important issues remain and should be discussed carefully. For example, how much and how broadly should industrial ecology be expected to contribute to sustainable industrialization? Which reforms are most likely to be useful in achieving sustainable industrialization? What actions are needed to improve both sustainable industrialization and sustainable consumption? Moreover, how can big developing countries, such as China, India and Brazil reduce their vulnerability to potentially damaging events and perceptions that may affect their international markets, and industrialization strategy?
7:00 p.m.	Boat Cruise (with dinner; board at 6.30 p.m.)

Tuesday, June 19, 2007

9:00 a.m. Plenary IV: **Henry Regier**, *Professor Emeritus, University of Toronto (Canada)*

From Stasis, Trend, Cycle, Stochastic Noise and Deterministic Chaos to Ecogenic Emergence

Does 'industrial ecology' include a dominant theme, or perhaps only a subtle Leitmotif, that relates to 'ecogenic emergence'? The late James Kay and I expanded the connotations of the term 'ecogeny' from its more restricted meaning as introduced in paleontology several decades ago. For us, neither the 'eco' nor the 'geny' aspects can be understood satisfactorily if explicated using reductionistic science. In this we sensed that we shared a wide, if mostly implicit, consensus and we tried to help make the consensus explicit. Perhaps competent 'sanitation engineers' have long shared this consensus.

Recent features in the Great Lake Basin Ecosystem may be perceived from perspectives of several interacting ecogenic domains, e.g.: ecologics (implosion of native and explosion of non-native fish families, emergence of 'dead zones'); economics (disintegration of steel-smelting industry and integration of tourism); ekistics (corruption of old urban neighbourhoods and eruption of suburbs); eciatrics (disproportionate harm to organisms including humans from hormone mimics); and ecumenics (ideological struggles within evolutionary liberal and revolutionary libertarian versions of 'democracy'). Currently, do the scale and tempo of ecogenic emergences within this family of phenomena imply the death throes of Western Modernism and/or the birth pangs of an emerging Something Else here in our Basin?

Besides space, time, mass and exergy, there is a large role for 'information' in ecogeny. In recent decades, biological evolutionists have resurrected a version of horizontal mutualistic Lamarckism that facilitates fast evolution as having comparable importance to a common version of vertical antagonistic Darwinism with its slow evolution (Nature, 25 January 2007, page 369). Experimental economists are finding that altruism and selfishness both play strong roles in evolutionary processes as well as in current economic practice. In a humanistic context, this dialectic may map into the continuing Nature vs. Nurture debate. This stale dialectic may be part of current ecogeny but can be transcended.

What about less objective 'feelings'? How are ethics, aesthetics and numenistics of legitimate actors reflected in the discipline of industrial ecology and in emergent ecogenics more generally? Only in democratic conventions concerning fair discourse and decision making or also in technical services? Should duly-credentialed governance-oriented technocrats be competent to comprehend different kinds of technical services for interests that differ with respect to their legitimate commitments of a 'feeling' type? If not, why not?

Real-life examples will be sketched with respect to the above notions.

10:00 a.m. Parallel Sessions

10:20 a.m. Semi-Plenary, **Daniel DeLaurentis**, *Purdue University (USA)*

The Role of Complexity in System-of-Systems Engineering

A system-of-systems (SoS) consist of multiple, heterogeneous, distributed, independently operating systems that occasionally come together to achieve a unique capability. When collaborating, these systems are embedded in networks at multiple levels that evolve over time. As a result of the aerospace/defense heritage of the term, perhaps the most active group discussing methodologies for SoS is the systems engineering community. Thus, the notion of System-of-Systems Engineering (SoSE) has arisen and researchers are seeking to understand how design and decision-making is different in this new context. While defense-related applications have driven the recent emphasis on SoSE, many of society's needs across diverse domains are met through systems-of-systems. Many of these current SoSs are inflexible in response to disruption (artificial or natural) and/or are unable to scale effectively with increases in service demand. We hypothesize that a common thread in all these challenges is the complexity that arises from their nature as an SoS.

The sources and consequences of complexity in SoSE will be explored in this presentation. We begin by adopting the view that complexity is a comparative measure which characterizes, in its most basic form, the amount of information necessary to describe a system. In a SoS, the likely heterogeneity of systems (to include "actors"- the individual and organizational stakeholder systems), connectivity in networks, emergent behavior, and the trans-domain nature of required models all introduce sources of complexity. A central task in developing a methodology for SoSE is the structuring of complexity in a hierarchy of abstraction levels and across the scope dimensions of technological resources, operations, economics, and policy. The ultimate goal of this and related research, still far from achieved, is a very practical one: to better engineer success in the various systems-of-systems that exist in our society.

11:00 a.m. Refreshment Break

11:20 p.m Parallel Sessions

12:40 p.m. Lunch (Hart House)

2:00 p.m. Plenary Debate: Is IE Consistent With Sustainability?

Chair: **Chris Kennedy**, *University of Toronto*
Participants:
John Robinson, *Professor, Institute for Resources, Environment and Sustainability; and Director, Centre for Interactive Research on Sustainability, University of British Columbia (Canada)*
Bob Gibson, *Professor, Department of Environment and Resource Studies, University of Waterloo (Canada)*
John Ehrenfeld, *Executive Director ISIE*

The discipline of Industrial Ecology has long been motivated by concerns over sustainable development and has made great progress in the study of energy and material flows, product and process life cycles, various types of metabolism, etc.; but do we really know what a sustainable economy would look like? How important is it to add consumption to our agenda? Are the current analytical frameworks of IE too static, or the policy implications too incremental? What lessons can be learned from the emerging field of complexity science, which seeks to understand complex, adaptive, non-linear, flip-flopping systems? What are the critical research questions for Industrial Ecology and for Sustainability in general; and to what extent do they overlap?

3:00 p.m. Closing Ceremony (Society awards; student competition presentation; ISIE members open meeting)

4:00 p.m. Finish

DETAILS OF PARALLEL SESSIONS

Sunday, June 17, 2007

	BA 1160	BA 1170	BA 1180	BA 1190	BA 1200
11:20 – 12:40	**A5: Uncertainty in LCA/MFA** Chair: **Shinichiro Nakamura** Statistical Methods for treating uncertainties in material flow analysis – result demonstrated with U.S. zinc cycle, **Jing Cao, Daniel Mueller** Uncertainty as decision support in life-cycle interpretation, **Johan Pettersen, Edgar G. Hertwich** Uncertainty analysis and hybrid process-economic LCI, **Eric Williams** Data Rectification and Reliability Estimation of Life Cycle Inventories, **Bhavik Bakshi, Heui-Seok Yi**	**A14: Sustainable consumption (I)** Chair: **Edgar Hertwich** Characteristics and Demographics of the International Environmental Impacts of American Household Consumption, **Christopher Weber, H. Scott Matthews, Eric D Williams** Trends and Determinants of Household Water and Electricity Consumption in Shanghai, China, **Han Shi, Marian Chertow** Can environmental taxes promote sustainable consumption? An analysis for the Netherlands, **Kees Vringer, Corjan Brink, Eric Drissen, Onno Klinkenberg, Durk Nijdam, Harry Wilting** Governing the change to sustainable consumption and production, **Arnold Tukker**	**B15: Sustainable cities and regional metabolism (I)** Chair: **Thomas Theis** An Integrated Framework for Sustainability Assessments of Urban Environments, **Moira Zellner, Thomas Theis** Planning for Sustainable Future Cities: Optimizing Density, Transportation, Land use and the Natural Support Systems, **Debapratim Pandit, Satoshi Ishii, Toshiya Aramaki, Hanaki Keisuke** Building and City-Scale Cost Gap Analysis for Green Roof Implementation, **Corrie Clark, F. Brian Talbot, Peter Adriaens** Cities, services and their metabolism. Case study in the urban park of Montjuïc (Barcelona, Catalonia, Spain), **Jordi Oliver-Solà, Montserrat Núñez, Xavier Gabarrell, Assumpció Anton, Joan Rieradevall**	**C23: MFA, LCA and EIO cases studies from developing countries** Chair: **Dingjiang Chen** Application of Material Flow Analysis for solid waste and wastewater management in Haiphong City, Vietnam, **Toshiya Aramaki, Nguyen Thi Thu Thuy** Mass Flow Assessment and Assessment of Recycling Strategies for Cathode Ray Tubes in South Africa, **Mathias Schluep, Dominik Zumbuehl, Susanne Kytzia** Process Integration for Sustainable Production Planning in an Agricultural Cooperative, **Jutta Geldermann, Jens Ludwig, Martin Treitz, Otto Rentz** Material Metabolism of Economic System: Physical Input Monetary Output Analysis for China, **Ming Xu, Tianzhu Zhang**	**D27: Integrated sustainability assessment models (I)** Chair: **Claudia Binder** Accounting for Water: Strategic Decision Support for Sustainable Water Futures, **G Turner, T. Baynes, J. West, B. McInnis, M. Hoffman** Construction of the Methodology for Integrated Assessment based on Cost-Benefit Analysis and Applicability for Strategic Environmental Assessment, **Jun Nakatani, Toshiya Aramaki, Keisuke Hanaki** The Role of Narratives in Problem Structuring Methods for Sustainable Urban Water Systems, **Jim Petrie, Donald Hector, Carleton Christensen** A Case Study of Global Sustainable Development Indices by Integrated Assessment Model Linked with LCIA. **Hiroshi Yagita, Takanobu Kosugi, Koji Tokimatsu, Atsushi Kurosawa, Norihiro Itsubo, Ryota Ii, Masaji Sakagami**
2:00 – 3:20	**A2: Material flows and waste (I)** Chair: **Yuichi Moriguchi** The requirement for quantitative verification of waste and resource management policy, **Helmut Rechberger, David Laner, Nina Truttmann** Waste Input-Output-MFA of quantity metals with explicit consideration of smelting processes and by-production of precious metals, **Shinichiro Nakamura, Shinsuke Murakami, Kenichi Nakajima** Material Flow Analysis of Plastics and Metals in the Japanese economy based on WIO-MFA, **Kenichi Nakajima, S. Nakamura, Y. Yoshizawa, T. Nagasaka** Material Flow of E-waste in Asia, **Atsushi Terazono, Shinsuke Murakami, Aya Yoshida**	**A14: Sustainable consumption (II)** Chair: **Arnold Tukker** Examining the environmental soundness of growth of consumption and technology in Japan, **Keisuke Nansai, Shigemi Kagawa, Sangwon Suh, Minoru Fujii, Seiji Hashimoto, Yuichi Moriguchi** Environmental Impact of Consumers' Behaviour Due to Income, Time Use, and Price Changes: Consumption "Technologies" and the Waste Input-Output Model, **Koji Takase, Yasushi Kondo** Enabling Carbon Offsets at Point of Purchase for E-commerce Deliveries, **H Scott Matthews, Anny Huang, Aweewan Mangmeechai, Ramsay Huntley, Craig Coulter** Input-Output Based Comparison of Household Energy Use and Greenhouse Gas Emissions for Canada and the U.S., **Thomas Ferguson, Heather L. MacLean**	**B15: Sustainable cities and regional metabolism (II)** Chair: **Thomas Theis** Development of a Metamodel for Informing More Sustainable Urban Development: Preliminary Results, **John Crittenden, K. Li, S. Guhathakurta, A. Sawhney, P. Zhang, H. Fernando, P. McCartney, N. Grimm, H. Joshi, G. Konjevod, Y. Choi, S. Winter, D. Gerrity, R. Kahhat, Y. Chen, B. Allenby, P. Torrens** Deriving Performance Measures from Integrated Land-Use and Transportation Models to Assess the Sustainability of Transport Policies, **Marianne Hatzopoulou, Eric Miller** Dynamic Life Cycle Energy Flow Analysis of Residential Building Systems – Contributions to Regional Metabolism in Norway from 1960 to 2040, **Helge Brattebo, N. Holck-Steen, H. Bergsdal, R. Bohne** Horticulture city, **Jan de Wilt, Peter Oei**	**C22: Eco-industrial development in Asia (I)** Chair: **Anthony Chiu** Current activities towards the eco-industrial estate of Map Ta Phut, Thailand, **Kitikorn Charmondusit, P. Rungraunsri, K. Tappatat** Empirical Research On Corporate Environmental Governance -A Case Study In Qingdao, P.R.China, **Lei Shi, Jun Bi, Lu Xing** Application of Industrial Energy Integration Method for Sustainable Development in Korea, **Song Hwa Chae, Sang Hun Kim, Sung-Geun Yoon, Sunwon Park** EIP Master Plan for the Economic & Technological Development Zones (ETDZ) in China – Methodology and Case Study of Fuzhou ETDZ, **Weiqiang Chen, Shi Lei**	**D27: Integrated sustainability assessment models (II)** Chair: **Claudia Binder** Sustainable Development and Environmental Decision-making - Innovative Tool for Environmental Decision making in Multistakeholder Contexts, **Lanka Thabrew, Robert Ries** Modelling Industrial Symbiosis using System Dynamics, **Bertha Sopha, Edgar Hertwich** Scenario analysis of the future sustainability of the supply of clothing and textiles to the UK, **Julian Allwood, Soren E Laursen, Cecilia M de Rodriguez, Nancy M P Bocken** Technology Change and Environmental Management for Cement Manufacturing in the United States, **Jose L. Aguirre, H. Scott Matthews, Chris Hendrickson**

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Sunday, June 17, 2007 cont'd

	BA 1160	BA 1170	BA 1180	BA 1190	BA 1200
3:40 – 5:00	A2: **Material flows and waste (II)** Chair: **Eric Williams** Material Flow Accounting and Waste Production Forecasting - A Tool for Decision Making, **Paulo Ribeiro, Paulo Ferrao, Samuel Niza** Industrial Ecology Improves the Understanding of Dynamics in the Future CD Waste Management System, **Havard Bergsdal, Helge Brattebo, Rolf André Bohne, Daniel Muller** Theory and Evidence of Displaced Production through Reuse and Recycling, **Roland Geyer, Vered Doctori Blass** Copper cycles in Germany: stocks, flows, dissipative losses and the role of recycling, **Stefan Goessling-Reisemann**	A8: **Sustainable manufacturing and cleaner production** Chair: **Valerie Thomas** An End-of-Life Decision Methodology to Support Recycling Practices in the Footwear Industry, **Theodoros Staikos, Shahin Rahimifard** Waste input-output analysis of advanced loop-closing systems by combining established manufacturing infrastructure and innovative environmental technologies, **Noboru Yoshida, Yugo Yamamoto, Yuichi Moriguchi, Hiroshi Naito** Dynamic Material Flow Analysis of Steel Scraps in Asian Countries: Case studies for Japan, South Korea, China and Taiwan, **Yasunari Matsuno, Yuma Igarashi, Ichiro Daigo, Yoshihiro Adachi, Tetsuya Nagasaka** Sustainability Limits of Products Designed for Multi-lifecycle, **Israel Dunmade**	B16: **Sustainable urban water** Chair: **Barry Adams** Sustainable Water Metabolism: The Toronto Port Lands Design Challenge, **Brenna Enright** Relationship between urban morphology and sustainability of water supply systems, **Khoi Luong, Barry Adams** Using GIS, Process Simulation and Systems Optimization to Maximize Industrial Water Reuse, **Joseph Stano** Sustaining Fresh Water Resources within Urban Area-A Case of Bhopal City: A City Of Lakes in Central India, **Alka Bharat, Divya Sharma**	C22: **Eco-industrial development in Asia (II)** Chair: **Andreas Koenig** Organizational Forms and Determinants of Industrial Symbiosis in China: A Transaction Cost Economics Perspective, **Han Shi** Comparative Study on Processes and Outcomes of Eco-industrial Park between Japan, China and Korea, **Juan Liu, Toru Matsumoto, Tadashi Tsuruta, Eiji Katsuhara** The Practice of the Logo for Ecological Management of Industrial Solid Wastes in Tianjin Economic-Technological Development Area (TEDA) in China, **He Xu, An Fei Song Yuyan** Evaluation System Eco-Industrial Parks as Driving Infrastructures for Sustainable Urban Environmental Management, **Tsuyoshi Fujita, Emiri Nagasawa, Satoshi Ohnishi**	F35: **Process systems engineering** Chair: **Jim Petrie** Function Model to Support Supervising Environmental Impact and Chemical Risk by SME, **Yasunori Kikuchi, Masahiko Hirao** A dynamic planning framework for the developing eco-industrial parks, **Lei Shi** Process systems engineering and supply chain management contributions to IE, **Jessica Beck, Brett Cohen, Jim Petrie** Chemical Systems Engineering Models for Eco-Industrial Parks, **Ander H Stromman, Heinz Preisig, Ivan Dones, Xiangping Zhang, Christian Solli, Edgar G. Hertwich**

Monday, June 18, 2007

	BA 1170	BA 1180	BA 1190	BA 1200	BA 1230
10:00 – 11:00	A1: **Material and substance flows on global, regional and national scales (I)** Chair: **Heinz Schandl** Combining Material Flow Analysis with Data Envelopment Analysis to evaluate the performance of stages in material cycles, **Elif Kongar, Daniel B. Mueller** Assessing Impacts of Megaquarry Development in the Cement Industry through Spatial and Transportation Network Analysis, **Alissa Kendall, Stephen E. Kesler** The contemporary global nickel cycle: results, analysis, and outlook, **Barbara Reck**	A9: **Agriculture, forestry and land-use (I)** Chair: **Karlheinz Erb** Agroparks - Food production in Deltametropoles, **Jan De Wilt** Enhancing material efficiency in a dynamic material flow model - The case of forest-based industry, **Witold-Roger Poganietz, Andreas Uihlein, Liselotte Schebek** Food or Energy? Towards Sustainable Land Use - A Life Cycle Approach for the Assessment of the Carbon Intensity of Land Use for Food and Bioenergy in the U.K., **Miguel Brandao, Roland Clift, Llorenc Milàì Canals**	F33: **Eco-materials and design for the environment** Chair: **Li Shu** The metabolism of buildings: the unique spatial, temporal and physical attributes of contemporary construction, **John E. Fernandez** Integrated Structure and Materials Design for Sustainable Concrete Transportation Infrastructure, **Michael D. Lepech, Gregory A. Keoleian, Victor C. Li** Environmental assessment of magnesium component supply chain in automotive industry, **Ambalavanar Tharumarajah, Paul Koltun**	E30: **Supply chain management** Chair: **Masanobu Ishikawa** Management of food supply chains: the relationship between supply chain governance and eco-efficiency, **Roland Clift, Sarah Sim, Mike Barry, Sarah Cowell** Supply chain management in local networks of food and bioenergy – Small scale rural entrepreneurs pioneering sustainable development in supply chains, **Ari Paloviita, Marja Järvelä, Suvi Huttunen, Antti Puupponen** Life cycle considerations for environmental management of an infrastructure manager, **Nicolas Svensson, Mats Eklund**	B17: **Urban energy systems** Chair: **Sabrina Spatari** A new concept and a tool for promoting distributed energy systems at the urban scale, **Joao Parente, Paulo Ferrao** Kyoto targets for growing urban regions: using the case study of Geneva, Switzerland to understand the potential and limits of regional approaches to climate and energy policy implementation, **Julia Steinberger** Implementing industrial symbiosis for sustainable city transports based on biogas production, **Mats Eklund**

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	BA 1170	BA 1180	BA 1190	BA 1200	BA 1230
11:20 – 12:40	A6: **Advances in input-output analysis for IE (I)** Chair: **Sangwon Suh** An analysis of the differences in results between regular and hybrid LCAs illustrated by the example of Fuel Cell vehicles, **Rene Kleijn, E. vd Voet, G. Huppes, H. A. Udo de Haes** Inter-regional Waste Input-Output Model and Best Available Eco-efficiency of Regional and Nationwide Economy, **Yasushi Kondo, Shigemi Kagawa, Masato Yamada, Koichi Tachio** Pollution Flows in International Trade: Accounting for intermediate imports, **Glen Peters, Edgar Hertwich** Tracking consumption impacts: using multi-country extended input-output hybrid model and process LCA to assess local emissions and human health impacts of globalized production-consumption chains, **Damien Friot, Olivier Jolliet, Julia Steinberger**	A10: **Bio-energy** Chair: **Heather MacLean** Biomass Supply for a North American Biofuel Infrastructure, **Magdalena Gronowska, Heather L. MacLean, Sabrina Spatari** Characterization of Carbon and Nitrogen Fluxes in Crops Grown for Energy, **Shelie Miller, Jim Chamberlain, Amy E. Lands, Thomas L. Theis** Lignocellulosic Biorefinery Concept and Industrial Symbiosis in British Columbia, **Emmanuel Ackom, Paul McFarlane, Warren Mabee, Jack Saddler** LCA and LCC of Biomass for fuel, **Lin Luo, G. Huppes, E. van der Voet, H.A. Udo de Haes**	E29: **Industrial symbiosis: Eco-industrial parks and networks (I)** Chair: **Ray Cote** Toward a Theory of Industrial Symbiosis, **Marian Chertow, John Ehrenfeld** Systems engineering for sustainable growth through creation of an eco-industrial park, **Cecilia Haskins** Evaluation of Industrial Symbiosis through a Business Perspective: A Case Study of the Yorkshire and Humber Region in the UK, **Abhishek Agarwal, Peter A. Strachan** Collaborative Industry Research to Develop Inorganic By-Product, Water, and Energy Synergies: Experiences and Lessons from Kwinana, **Dick van Beers, Rene van Berkel**	E28: **Business perspectives on waste management** Chair: **Pierre Desroches** Strategies for implementing WEEE management infrastructures: technological and business challenges, **Paulo Ferrao, Paulo Ribeiro, Eduardo Santos, Mónica Luízio** Closing the Cycle of Aseptic Packaging: The case of entrepreneurial networks in Brazil, **Renato J. Orsato, Luk van Wassenhove** Industrial Waste Exchange Program, **Helene Gignac, Claude Maheux-Picard** Historical Perspective on Environmental Kuznets Curve and Porter Hypothesis, **Pierre Desrochers**	B19: **Sustainable buildings, neighbourhoods and materials (I)** Chair: **Kim Pressnail** The Role of Office Buildings in the Total Environmental Impacts of the Built Environment, **Arpad Horvath, Pedro Santos Vieira, Mike Chester** Dynamic eco-efficiency for analyzing sustainable housing, **Rolf André Bohne, Havard Bergsdal, Helge Brattebo, Nina Holck-Steen** Optimal Clothes Washer Replacement Policy for Households, **Gregory Keoleian, Richard Bole** Moderating the Impact of Sustained Energy Interruptions Through the Design and Construction of Low-Energy Homes, **Russell Richman, K.D. Pressnail, A.M. Kirsh**
2:00 – 3:20	A6: **Advances in input-output analysis for IE (II)** Chair: **Helga Weisz** A Global Regionalised Environmentally Extended Input-Output Database with a Focus on the EU25, **Arnold Tukker** Heavy Metals Through the Years: Flows and Impacts, **Cortney Higgins, Chris Hendrickson, H. Scott Matthews, Mitch Small** Opportunities for Industrial Ecology in Power Generation Supply Chains, **Joe Marriott, H. Scott Matthews** Incorporating MFA into spatio-temporal simulation of material consumption and embodied energy: Example of construction material, **Manoj Kumar Roy, Robin Curry, Geraint Ellis**	A11: **Energy, carbon and economic growth** Chair: **Paulo Ferrao** Bringing the Solar Energy Supply Chain Out of the Shadows: Assessment of Photovoltaic and Battery Related Heavy Metal Flows Using the MUIO-LCA Model, **Troy Hawkins, Chris Hendrickson, H. Scott Matthews** LCA of CO2 Enhanced Oil Recovery from the North Sea, **Edgar Hertwich, Martin Aaberg** Austria's carbon metabolism 1830-2000: Implications of the agrarian-industrial transition, **Helmut Haberl, Karl-Heinz Erb, Veronika Gaube, Simone Gingrich, Fridolin Krausmann** The relationship between changes in carbon economic intensity and state economic performance: how do changes in carbon intensity affect economic growth?, **Brynhildur Davidsdottir, Michael Fisher**	E29: **Industrial symbiosis: Eco-industrial parks and networks (II)** Chair: **Miriam Chertow** Measuring the performance of eco-industrial parks' operation, **Sangwon Suh, Sangyong Kim** Measuring Eco-Industrial Development: Evaluation of Resource Consumption and Performance Indicators in a 'Typical' Canadian Industrial Park, **Tracy Casavant** Measuring environmental performance in regional industrial ecosystems – Puerto Rico case studies, **Weslynne Ashton** A regional Industrial Symbiosis methodology and its implementation in Geneva, Switzerland, **Guillaume Massard, Suren Erkman**	E31: **Business and IE** Chair: **Helge Brattebo** Applying IE In A Business Environment, Transforming Environmental Innovation into Business Practice, **Robert Lucacher, Robert Frosch** A Game-theoretic Model for Increasing "Producer Responsibility": Refillables in the Packaging Market, **Hilary Grimes-Casey, Thomas P. Seager, Christopher S. Ruebeck, Thomas L. Theis** Corporate Responsibility in the German and Brazil automotive industry, **Susanne Hartard, Marilia Vaz Costa, Marilia, Aleksandra Spizewska** Application and Enlargement of the Scientific, Process Oriented Material Flow Analysis Method with Information Flow Analysis: Dynamic Route Planning in Truck Fleet Management, **Frank Hartmann**	B19: **Sustainable buildings, neighbourhoods and materials (II)** Chair: **Greg Keoleian** Assessing the Impact of Urban Form on Livability and Sustainability, **Reihane Marzoughi, W.H. Vanderburg, H.L. MacLean** Costing Tool for Sustainable Neighbourhood Design, **Joshua Engel-Yan, Brian Hollingworth, Douglas B Pollard** Dynamic Life Cycle Modeling of Pavement Overlay System: capturing the impacts of users, construction, and roadway deterioration, **Han Zhang, Gregory A. Keoleian, Shunzhi Qian, Victor C. Li** Sustainable housing for New Orleans: modeling urban metabolism for green construction, **John E. Fernandez**

Tuesday, June 19, 2007

	BA 1170	BA 1180	BA 1190	BA 1200	GB 303
10:00 – 11:00	A1: **Material and substance flows on global, regional and national scales (II)** Chair: **Heinz Schandl** The global metabolic transition – empirical evidence of an ongoing process, **Fridolin Krausmann, Simone Gingrich, Karl-Heinz Erb, Helmut Haberl** Island Limits: The physical dimension of sustainability in Ireland, **Robin Curry, Cathy Maguire, Craig Simmons, Kevin Lewis** Global socio-metabolic patterns of copper and aluminum– past trends and future options, **Nina Eisenmenger, Helga Weisz**	A9: **Agriculture, forestry and land-use (I)** Chair: **Julia Steinberger** Environmental impact and added value in forestry operations in Norway, **Ottar Michelsen, Christian Solli, Anders Hammer Stromman** Analyzing impacts of the global socio-economic biomass metabolism on terrestrial ecosystems, **Karlheinz Erb, Helmut Haberl, Fridolin Krausmann, Veronika Gaube, Simone Gingrich** Modelling farmers' decision-making on land use: An integrated view on socio-ecological systems, **Veronika Gaube, Heidi Adensam, Julia Lutz, Tina Kaiser, Martin Wildenberg, Andreas Richter, Helmut Haberl**	C21: **Sustainability issues in developing countries** Chair: **Yong Geng** Eco-efficiency evaluation of industrial system in China: an extension data envelopment analysis approach, **Bing Zhang, Jun Bi** International Flow of Recyclable Materials and the Prospects for Creating an Asian Regional Recycling Network, **Yasuhiro Hotta**, Mark Elder, **Hideyuki Mori** Study on Building Shanghai into a Circular Economy Oriented Sustainable City, **Dajian Zhu, Wu Yi**	F32: **Energy technologies of the future** Chair: **Sabrina Spatari** Environmental bottlenecks of a renewable based hydrogen economy, **Rene Kleijn, E. vd Voet, G. Huppes, H. A. Udo de Haes** A Comparative Hybrid LCA of the Economic and Environmental Impacts of Two Oil Sands Extraction Methods, **Joule Bergerson, David Keith** Mongstad Future Fuel Park – Flexible Options for Producing New Fuels in a Carbon-Constrained World, **Zhang Xiangping, Anders H. Stromman, Christian Solli, Edgar G. Hertwich**	D26: **Complex systems (I)** Chair: **Gerard Dijkema** Modelling industrial ecosystems as populations of agents, strategies and artifacts, **Yannis Mouzakitis, Emmanuel Adamides, Stavros Goutsos** Facilitating Interdisciplinary Research into Industrial Infrastructures, **Pieter Beers, Pieter Bots** Aristotle's natural law as a rule to elaborate a set of indicators within industrial ecology's framework, **Frederic Paul Piguet, Suren Erkman**
11:20 – 12:40	A13: **Policy applications of IE (I)** Chair: **Derry Allen** Sustainable resource use: how to measure progress? **Ester van der Voet, Sander de Bruyn, Lauran van Oers, Maartje Sevenster** Evaluating climate projects on a city level – a survey of a few existing methods and their applicability based on experiences from Stockholm City Climate investment program (KLIMP), **Stefan Johansson, Ronald Wennersten, Nils Brandt** Challenges and perspectives of international sustainable resource management, **Stefan Bringezu** Technology, Risk, and Sustainable Development, **Ronald Wennersten, Jan Fidler**	A4: **LCA (I)** Chair: **Sangwon Suh** Barriers and opportunities for increased use of LCA-based tools for the built environment -Stakeholders responses, **Karolina Brick, Björn Frostell, Cecilia Björkman** Utilizing Leontief 's Price Model to Estimate Input Structures, **Anders Hammer Stromman, Christian Solli** Hybrid LCA Model Specific to Oil Sands Technologies, **Alex Charpentier, Heather L. MacLean** LCA of Alternative Petroleum Refinery Technology: Gasoline versus Diesel Transportation Fuels, **Donald Hanson, John J. Marano**	C20: **IE for developing countries (I)** Chair: **Ramesh Ramaswamy** Evaluation of Eco-efficiency Indicators in Iron and Steel Industries in Nepal, **Govinda Prasad Kharel, Kitikorn Charmondusit** Developing Circular Economy in China: Challenges and Opportunities for Realizing Leapfrog, **Yong Geng, Anthony Chiu** Ecological Footprint Applied to the Input-Output Model, **Sergio Pacca** A Decision Support Tool for Traditional Industrial Systems' Eco-Industrial Transformation, **Shanying Hu, Jianting Wang, Dingjiang Chen**	B18: **Urban waste management** Chair: **Pierre Desroches** Potential Energy Recovery and CO2 Reduction from Organic Food Waste in Yokohama: Centralized or De-Centralized Biogas System Options, **Satoshi Ishii, Keisuke Hanaki** Analysis of waste prevention policies applied at the solid waste management in Brazil, **Ana Paula Bortoleto, Keisuke Hanaki** Planning and evaluation of environmental improvement effects for municipal solid waste matter recycling scheme, **Looi-Fang Wong, Tsuyoshi Fujita** Exergy analysis applied to the collection of used cooking oil (UCO) for biodiesel production, **Laura Talens, Villalba Méndez, Gara Gabarrell i Durany, Xavier**	D26: **Complex systems (II)** Chair: **Dan DeLaurentis** The use of agent-based models in developing transition instruments for industrial networks – a focus on management of uncertainty, **Ruud Kempener, L. Basson, B. Cohen, J.G. Petrie** Complex Adaptive Systems and Industrial Cluster Development: How to support the RDA? **Igor Nikolic, Gerard P.J. Dijkema** Network Complexity of Industrial Symbiosis System: Gongyi case in China, **Yumeng Song, Shi Lei** The structure and evolution of regional industrial ecosystems: Case studies of Barceloneta and Guayama, Puerto Rico, **Weslynne Ashton**

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	BA 1170	BA 1180	BA 1190	BA 1200	GB 303
2:00 – 3:20	A13: **Policy applications of IE (II)** Chair: **Derry Allen** Identifying Secondary Materials Markets in Portugal: the role of Waste Stock X-changes, **Inês Costa, Eloísa Cepinha, Joana Veloso, Paulo Ferrao** MFA as a tool in policymaking processes – Experience from the revision of Norway's "National Action Plan for Construction and Demolition Waste", **Rolf André Bohne, Havard Bergsdal, Helge Brattebo** The use of MFA and the Ecological Footprint in sustainable development policy making: a case study of Northern Ireland, **Cathy Maguire, Robin Curry, Craig Simmons, Kevin Lewis** Producer Responsibility Organizations assuming producer responsibility for end-of-life products in Portugal, **Eduardo Santos, Paulo Ribeiro**	A4: **LCA (II)** Chair: **Ester van der Voet** Which is a better material to fulfill a function?, **Minoru Fujii, Seiji Hashimoto, Masahiro Osako, Yuichi Moriguchi** Combining Dynamic MFA and IO-LCA in Studies of Material and Energy Flows in the Built Environment, **Havard Bergsdal, Helge Brattebo, Rolf André Bohne, Christian Solli, Anders Hammer Stromman** Hybrid and Thermodynamic Life-Cycle Assessment of Fossil and Biomass-Based Transportation Fuels, **Anil Baral, Bhavik R. Bakshi** Comparative Energy, Environmental and Economics Analysis of Traditional and E-Commerce DVD Rental Networks, **Sivaraman Deepak, Sergio Pacca, Kimberly Mueller, Jessica Lin**	C20: **IE for developing countries (II)** Chair: **Reid Lifset** Material Flow Analysis (MFA) and economic evaluation of material flows as a combined model for durable consumer goods, **Martin Streicher-Porte, Hans Peter Bader, Ruth Scheidegger, Susanne Kytzia** Industrial Ecology and the Circular Economy in China, **Marian Chertow** How the enterprise ownership affects industrial symbiosis: cases in China, **Zhen Wang, Lei Shi** Industrial Clustering: Is it a Panacea to Industry's Environmental and Economic Challenges in Zimbabwe?, **Peter Rwakatiwana, Charles Mbohwa**	D24: **IE and the transition to sustainability** Chair: **John Robinson** Industrial Ecology: Hard Science or Gentle Inspiration, **Peter Wells, R. Orsato** Industrial Ecology – an integrating discipline contributing to sustainable production and consumption systems?, **Bjorn Frostell, Larsgöran Strandberg** Three fundamental approaches to assess human-environment systems with respect to sustainable development: Strength, weaknesses and synergies of scenario-based assessment, impact assessment and systemic assessment approaches, **Daniel J. Lang, Arnim Wiek** The Centre for Interactive Research on Sustainability, **John Robinson**	E29: **Industrial symbiosis: Eco-industrial parks and networks (III)** Chair: **Tracy Casavant** Network Brokerage in Facilitated Industrial Symbiosis, **Jennifer Howard-Grenville, Raymond Paquin** Collaborative tools for industrial symbiosis evolution, **Gabriel Grant, Thomas Seager** Mongstad, a new Kalundborg?, **Anders Hammer Stromman, Christian Solli, Xiangping Zhang, Edgar Hertwich** Map it! Harnessing Geographic Information Systems for Applied Industrial Ecology, **Tracy Casavant**

Wednesday, June 20, 2007

	BA 1170	BA 1180	BA 1190	BA 1200	BA 1230
10:00 – 11:00	A3: MFA concepts Chair: **Stefan Bringezu** Laws of the Technosphere, Ester van der Voet, **Ruben Huele, Ruud Stevers** Fair trial for industrial by-products – Importance of system boundaries, **Liselott Roth, Mats Eklund** Discrepancy in Trade Statistics for Used Products and Secondary Materials, **Masaaki Fuse, Yagita Hiroshi**	A7: Stock accounting and the relationship between stocks and flows Chair: **Helga Weisz** Historic patterns of anthropogenic iron stocks, **Daniel Mueller** What is the Real Resource Potentials of Secondary Resources? **Shinsuke Murakami, Tsuyoshi Adachi, Tomoko Shiranhase, Atsushi Terazono, Yuichi Moriguchi** Australian material resource flows and the global economy: an application of the Australian Stocks and Flows Framework to analyse Australia's resource futures, **Heinz Schandl, Franzi Poldy**	D26: Complex systems (III) Chair: **Jim Petrie** Complexity, the Holy Grail for Industrial Ecology? **Gerard Dijkema, L. Basson** SEMI-PLENARY The Role of Complexity in System-of-Systems Engineering, **Dan DeLaurentis** (see main program)	D25: Thermodynamics and information theory for IE Chair: **Eric Williams** Life Cycle Assessment of Emerging Technologies – Can Thermodynamics Help? **Zhang Yi, Bhavik R. Bakshi** Bayesian Material Flow Analysis, **Timothy Gutowski, Jeffery Dahmus, Dominic Albino** Efficiency dilution and technology asymptotes: Long-term exergy conversion trends in Japan, **Eric Williams, Robert Ayres, Benjamin Warr**	F34: Innovations in manufacturing processes for reduced impacts (I) Chair: **Julian Allwood** Re-inventing Metalworking Fluids: A Case Study in Greening the U.S. Manufacturing Sector, Andres Clarens, **Gregory A Keoleian, Kim F. Hayes, Steven J. Skerlos** Assessment of aqueous cleaning process by integrating life cycle and risk assessments, **Emi Kikuchi, Yasunori Kikuchi, Mashiko Hirao** Bayesian Material Flow Model, **Dominic Albino, Jeffrey Dahmus, Timothy Gutowski**
11:20 – 12:40	A12: Eco-efficiency Chair: **Gjalt Huppes** Measurement of Eco-efficiency in pulp and paper factory, a case study of pulp and paper industry, Myanmar, **Maung Maung Thant, Kitikorn Chamorn Dusit** Toolkit Application for Regional Synergy Opportunities, **Albena Bossilkov** Eco-Efficiency and Innovation for Primary Minerals and Metals Production, **Rene Van Berkel, Dick van Beers** Theoretical analysis of subjective choices in eco-efficiency, **Masanobu Ishikawa, Gjalt Huppes**	G36: Education and training Chair: **Ronald Wennersten** Architecture of Industrial Ecology – A model for education and communication on what is characteristic and makes the field unique, **Ralf Isenmann** Introducing Industrial Ecology to Broader Audiences, **Deanna Matthews, Troy Hawkins, Paulina Jaramillo, Joe Marriott, Aurora Sharrard, H. Scott Matthews** Development of a new simulation game for teaching material flow management in higher education, **René Keil, Mario Schmidt** Two years in Review – EcoStar Accomplishments, **Peter Lowitt, Neil Angus**	D26: Complex systems (IV) Chair: **Lauren Basson** Actors' incentives for improved wood waste management. the role of regulation and market interactions, **Joakim Krook** Applying Social Network Theory to Concrete Industry Standards: Identifying Levers for Sustainability in Concrete Infrastructure, **Peter Arbuckle, Michael D. Lepech, Gregory A. Keoleian** Governance as Discourse: Setting Sustainable Energy Targets in New Jersey, **Clinton Andrews, Randall Solomon, Skip Jonas** Industrial inertia and industrial change: Opportunities and Constraints for Environmental Policy, **Brynhildur Davidsdottir, Matthias Ruth**	D27: Integrated sustainability assessment models (III) Chair: **Daniel Lang** Smart labels for waste-resource management: an integrated assessment, **Claudia Binder, Svetlana Domnitcheva** Lessons about sustainability and sustainable development based on four historic case studies on product systems, **Theo Geerken** Common imperatives in peculiar places, **Robert Gibson** Toward Integrated Assessment of Technology and Policy Alternatives for Materials Use, **Jun-Ki Choi, Heui-Seok Yi, Bhavik R. Bakshi**	F34: Innovations in manufacturing processes for reduced impacts (II) Chair: **Tim Gutowski** Environmental performance of reuse of concrete and clay bricks, **Liselott Roth** Fundamental analysis of carbon emissions for manufacturing with aluminium and steel, **Jon Cullen, Julian M Allwood** Mass flow analysis and technological innovation in the manufacture of solid wood products in British Columbia, **Emmanuel Ackom, Paul McFarlane** Exploration of Technological Change of Japanese Waste Management Industry, **Naoya Abe, Shinsuke Murakami**

POSTERS

Monday, June 18, 2007, 3:20 p.m. – 4:40 p.m.

Theme A: Sustainable Social Metabolism

1. Global Industrial Ecology – the North-South Link: lessons from research and education, **Getachew Assefa** (A 1)
2. Recycling Information of Parts and Materials in End-of-Life Vehicles (ELVs) Recycling Industries in the United States, **Junghan Bae**, **Junbeum Kim**, **Sangwon Suh** (A 1)
3. Life-cycle resource mileages for material flows: metals used in automotive manufacturing in the United States, **Junghan Bae**, **Sangwon Suh** (A 1)
4. Dynamic Substance Flow Analysis of Aluminum and Its Alloying Elements in Japan, **Hiroki Hatayama**, **Yamada Hiroyuki**, **Daigo Ichiro**, **Matsuno Yasunari**, **Adachi Yoshihiro** (A 1)
5. Impacts of New Bridge Construction Technologies on US Cement Industry Material Flows, **Amit Kapur**, **Michael D. Lepech**, **Gregory A. Keoleian**, (A 1)
6. Decomposition analysis of factors in the generation of waste durables, **Oguchi Masahiro**, **Tomohiro Tasaki**, **Yuichi Moriguchi**, **Takashi Kameya** (A 1)
7. Interdisciplinary Planning Practices for Sustainable Development of Water Resources in the Wake of Global Changes, **Divya Sharma** (A 1) *– Cancelled*
8. The study of copper cycle in China, **Qiang Yue**, **Lu Zhongwu** (A 1) *– Cancelled*
9. Re-engineering Construction Waste Streams, **Fred Klammt** (A 2)
10. Used Automobile Battery Recycling in Asia, **Aya Yoshida**, **Shinsuke Murakami**, **Atsushi Terazono** (A 2)
11. Case Study: Eco-Development Planning in Kaiyang County, Guizhou Province, China, **Hui Gao**, **Chen Dingjiang**, **Hu Shanying** (A 3)
12. Economy Metabolism:Concepts and Analysis Framework, **Wang Junfeng**, **Hui Ming Li** (A 3)
13. MFA and Disaster Recovery: Material Requirements for Rebuilding New Orleans, **Erin Walsh** (A 3)
14. Conceptual program of sustainable product development of Dniepr river industrial region based on the systematic approach, **William Zadorsky** (A 3)
15. Hybrid Life Cycle Assessment: Modeling On-Site Construction, **Melissa Bilec**, **Robert J. Ries** (A 4)
16. Practical use of LCA-based tools for the built environment – a comparative study using two Swedish tools, **Karolina Brick**, **Björn Frostell** (A 4)
17. Predictive LCA/Predictive MFA: Framework and Application in a Case Study of Greenhouse Gas Policy in the Automotive Industry, **Hilary Grimes-Casey**, **Greg Keoleian**, **Colin McMillan**, **W.Ross Morrow**, **Steven Skerlos** (A 4)
18. ThermoLCA – A Software Tool for Thermodynamic Life Cycle Assessment, **Yi Zhang**, **Joel Lehman**, **Bhavik R. Bakshi**, **Joseph Fiksel** (A 4)
19. A Systematic Uncertainty Analysis of Life Cycle Assessment, **Hung Ming Lung**, **Hwong-wen Ma**, **Chia-Wei Chao** (A 5)
20. 2Sensitivity Analysis of the Reduction of Environmental Impacts due to the Home Appliance Recycling Law in Japan, **Katsuyuki Nakano**, **Ryosuke Aoki**, **Masahiko Hirao** (A 5)
21. Comparison of environmental multipliers of physical and monetary Leontief inverse, **Ilmo Maenpaa**, **Tiina Härmä** (A 6)
22. Untangling the Web of Heavy Metals in the U.S. Economy: Estimation of Supply Chain Cadmium, Lead, Nickel, and Zinc Intensity with the MUIO-LCA Model, **Hawkins Troy**, **Chris Hendrickson**, **H. Scott Matthews** (A 6)
23. Physical Input Monetary Output Analysis, **Ming Xu**, **Tianzhu Zhang** (A 6)
24. The effect of contamination of tramp elements on ferrous material flow: Analysis by Dynamic Waste Input Output Model, **Kazuyo Yokoyama**, **Kenichi Nakajima**, **Eiji Yamasue**, **Keisuke Nansai**, **Tetsuya Nagasaka** (A 6)
25. Stocks as potential wastes and secondary resources – Material Stock Accounts of construction minerals for Japan, **Seiji Hashimoto**, **Hiroki Tanikawa**, **Yuichi Moriguchi** (A 7)
26. Bottom-up Accounting of In-Use Copper and Iron Stocks at Different Spatial Scales, **Jason Rauch**, **Matthew Eckelman** (A 7)
27. Life span of commodities, **Tomohiro Tasaki**, **Shinsuke Murakami**, **Masahiro Oguchi**, **Seiji Hashimoto** (A 7)
28. The Dawn of a New Iron Age? A Bottom-Up Analysis of China's Mutilevel In-Use Stocks of Iron, **Tao Wang**, **Daniel Müller** (A 7)
29. Research on Building Regional Eco-industrial System in West China, **Dawei Zhang**, **Shanying Hu**, **Dingjiang Chen**, **Jingzhu Shen** (A 8)
30. Metal Casting: Moving to Sustainability, **Alissa Jones**, **Timothy Gutowski** (A 8)
31. Dynamic Material Flow Analysis of Steel Scraps in Asian Countries: Case studies for Japan, South Korea, China and Taiwan, **Yasunari Matsuno**, **Yuma Igarashi**, **Ichiro Daigi**, **Yoshihiro Adaachi**, **Tetsuya Nagasaka** (A 8)
32. Reducing the Environmental Impact of an Aluminium Pressure Die Casting Plant, **Belmira Neto**, **Carolien Kroeze**, **Leen Hordijk**, **Carlos Costa**, **Tinus Pulles** (A 8)
33. Life Cycle Aspects of Nanoscale Manufacturing Technologies, **Hatice Sengul**, **Thomas L. Theis**, **Siddhartha Ghosh** (A 8)
34. The relevance of clusters for "green" innovation: cased by the diffusion of lead-free soldering in electronics industry in China, **Xin Tong** (A 8)
35. Ecological Footprint Analysis of Liquid Crystal Display, **Allen Hu**, **Wen-Bin Li**, **Chia-Wei Hsu** (A 9)
36. Policies for integrated planning of land use and transport network in developing countries: A case of India, Kshama Puntambekar, Ashutosh Sharma (A 9) *– Cancelled*
37. Life Cycle Assessment of Firewood Based Heating, **Marte Reenaas**, **Solli**, **Christian Strømman**, **Anders Hertwich**, **Edgar** (A 9)
38. Supporting framework for biomass energy system planning, **Yuichiro Kanematsu**, **Masahiko Hirao** (A 10)
39. Global Warming versus Eutrophication: assessing the environmental affects of bio-based production, **Kristin Rogers**, **Thomas P. Seager**, **Amy Landis** (A 10)
40. Analysis on the modern situation, production situation, production intensification and its overall growing and promotion, **Rafık Ashrafov**, **Ilker Yucel Ogrenmish** (A 11)
41. Decomposition of the US economy: has the move to a service based economy in the US reduced carbon intensity? **Brynhildur Davidsdottir**, **Michael Fisher** (A 11) *– Cancelled*
42. What is sustainable energy development – and can we measure it? **Brynhildur Davidsdottir**, **Dan Basoli**, **Sarah Fredericks** (A 11)
43. Using General Circulation Models to Better Understand Continental Material Cycles, **Michael Ferrari** (A 11)
44. The Energy Benefits of Stainless Steel Recycling, **Jeremiah Johnson**, **B. Reck**, **T. Wang**, **T.E. Graedel** (A 11)

45. Impact assessment of resort development on lakes basins: application to Orford-Magog area, Southern Québec, **Guillaume Junqua**, **Géraldine Lepoittevin**, **Thomas Olivier** (A 11)
46. Is free trade an encumbrance for the environment? The case of primary aluminium, **Witold-Roger Poganietz** (A 11)
47. Alternative Transportation Fuels: An Evaluation of Distribution Methods for Hydrogen, **Heather Wakeley**, **W. Michael Griffin**, **Chris Hendrickson**, **H. Scott Matthews** (A 11)
48. Forecasting future economic growth under alternative energy efficiency and energy intensity scenarios, **Benjamin Warr**, **Nina Eisenmenger**, **Robert Ayres** (A 11)
49. New European Policies on waste management: exploring the concept of Secondary Raw Materials, **Inês Costa**, **Paulo Ribeiro**, **Paulo Ferrão** (A 13)
50. No Pet Bottle anymore, Yen Hsiu-Chien (A 13)
51. Risk assessment in the framework of sustainable development - the necessity of considering Worst Case Scenarios, **Jan Fidler**, **Ronald Wennersten** (A 13)
52. Refillable systems as an approach to change household consumption of packaging, **Tracy Bhamra**, **Vicky Lofthouse**, **Rebecca Cawtherley** (A 14)
53. Concept of Do-It-Yourself: sustainable solution for low income families in the Third World, **Aguinaldo dos Santos**, **Priscilla Ramalho Lepre** (A 14)
54. Lifestyle changes and their Influence on Substance Flow in Households of Asian Mega-cities, **Yonghai Xue**, **Toru Matsumoto** (A 14)

Theme B: Infrastructure for Sustainable Cities

55. Region-Scale Eco-Industrial Master Planning & Strategy: Planning for Long Term Economic and Ecological Prosperity, **Tracy Casavant** (B 15)
56. Metabolism Speed of Material Stock for de-materialization with city-scale 4D-GIS, **Tanikawa Hiroki**, **Seiji Hashimoto**, **Yuichi Moriguchi** (B 15)
57. International Association for Sustainable Agroparks - Innovating Agriculture in Metropolitan Areas, **Sander Mager**, **Jan de Wilt** (B 15)
58. Cities, services and their metabolism. Case study in the urban park of Montjuïc (Barcelona, Catalonia, Spain), **Jordi Oliver-Solà**, **Montserrat Núñez**, **Xavier Gabarrell**, **Assumpció Anton**, **Joan Rieradevall** (B 15)
59. Potentials for Eco Industrial Park Developments in Turkey, **Nihal Senlier**, **Albayrak**, **Ayse Nur** (B 15)
60. Opportunities of Food Waste Management in New York City, **Ning Ai** (B 18)
61. Urban-rural relationship in land management: Economic Waste Management Systems For Sustainable Environment in India, **Lalitkumar Chaudhari**, **A.S. Yevale**, **A.G. Bhole**, **S.P. Yawalkar**, **N.K. Choudhay**, **R.C. Bhattarchjee**, **A.V. Parwate** (B 18)
62. Evaluation of Integrated policy scenarios for building material circulation systems, **Akito Murano**, **Tsuyoshi Fujita** (B 18)
63. Eco-Industrial Networking: Greening Infrastructure to Create Sustainable Communities, **Tracy Casavant** (B 19)
64. Including Sustainability in Bridge Management Systems, **Christopher Gwaltney**, **Thomas P. Seager** (B 19)

Tuesday, June 19, 2007, 3:20 p.m. – 4:40 p.m.

Theme C: IE for Developing Countries

1. Resource Recovery from Waste to Wealth: An Indigenous Sustainable Agrarian Practice Using Wastewater at East Calcutta Wetlands, a Ramsar site in India, **Soumya Chatterjee**, **B. Chattopadhyay**, **S. K. Mukhopadhyay** (C 20)
2. Factual Obstacles of Executing Eco-Industrial Plan in Developing Region Rich in Mineral Resources: A Western-South China Case Study, **Dingjiang Chen**, **Hui Gao**, **Shanying Hu** (C 20)
3. Improvement of dredging operations management with industrial ecology and competitive intelligence, **Guillaume Junqua**, **Abriak Nor Edine** (C 20)
4. Agro-industrial symbiosis and population's living condition improvement in North Nigeria, **Pascale Schwab Castella**, **Guillaume Massard**, **Suren Erkman**, **Christophe Blavot** (C 20)
5. The sustainability of traditional populations exposed to technological changes, **Ester Galli**, **Erica Peipke** (C 21)
6. Sustainable development in Africa - possibility or myth?, **Venkatesh Govindarajan** (C 21)
7. Build an eco-industrial park in old industrial base in northeast China, **Ying Guo**, **Shanying Hu**, **Dingjiang Chen**, **Jianting Wang** (C 22)
8. Integrated Stability Analysis of Eco-Industrial Symbiosis Network, **Xiaoping Jia**, **Shi Lei**, **Zhang Tianzhu**, **Han Fangyu** (C 22)
9. Plan C: China's Development under the Scarcity of Natural Capital, **Dajian Zhu**, **Wu Yi** (C 22) *– Cancelled*
10. Material Flow analysis in eco-industrial park planning, **Ying Guo**, **Shanying Hu**, **Dingjiang Chen** (C 23)

Theme D: Transition to Sustainability in a Complex World

11. Considering Human Factors Perspectives on Sustainable Energy Systems, **Scott A. C. Flemming**, **A. Hilliard**, **G.A. Jamieson** (D 24)
12. Frame Analysis and environmental conflicts in Guanabara Bay, Brazil, **Ester Galli**, **Erica Peipke** (D 24)
13. A Framework of Sustainability Network Theory (SNT) and Model for Industrial System, **Kim Junbeum**, **Braden Allenby** (D 24)
14. An Agent Based Model to study the impact of CO2 emission-trading on electric power generation, **Emile Chappin**, **G.P.J. Dijkema** (D 26)
15. An Agent Based Analysis for Optimisation of the Coal-Electricity Supply Network, **Brett Cohen**, **L. Basson**, **J.G. Petrie** (D 26)
16. Helping RDAs to Shape a Biobased Cluster - the Costa Due Case, **Gerard Dijkema**, **R.M. Stikkelman**, **I. Nikolic**, **M.P.C. Weijnen** (D 26)
17. Systems engineering modeling: a new tool to achieve industrial ecology project, **Sabrina Brullot**, **Dominique Bourg**, **Nicolas Buclet**, **Fabrice Mathieux**, **Guillaume Massard** (D 27)
18. A Multi-Media Stocks and Flows Model for Regional Water Budget Analysis, **Yi-Wen Chiu**, **Sangwon Suh** (D 27)
19. Development and implementation of a nationwide landfill rating systems in Switzerland – a contribution to sustainable development, **Daniel Lang**, **Roland W. Scholz** (D 27)
20. Development of Quantitative Sustainability Assessment Tool (QSAT) for Bauxite Residue Management, **Rene van Berkel**, **Greg Power**, **Dick van Beers** (D 27)
21. Environmental and economic implications of bioenergy in Ontario, Canada, **Yimin Zhang**, **Sabrina Spatari**, **Heather L. MacLean** (D 27)

22. Integrated Assessment for Emerging Chemicals of Concern, **Qiong Zhang**, **Heather Wright**, **James R. Mihelcic** (D 27)

Theme E: Business and Management for IE

23. How production theory can support the analysis, planning and understanding of waste reduction and recycling systems, **Martina Prox**, **Andreas Moeller** (E 28)
24. How should be waste management and recycling policies with Extended Producer Responsibility:EPR concept? **Murakami Rie**, **Shinsuke Murakami** (E 28)
25. You Mean That Isn't Legal? Policy Frameworks That Support Eco-Industrial Parks: Innovista Industrial Park and Other Case Studies, **Tracy Casavant** (E 29)
26. Sustainability in the Largest Oil and Gas Region in Canada: Green Industrial Development in Fort McMurray, Alberta, **Tracy Casavant** (E 29)
27. MESVAL, valuation initiatives in the frame of industrial ecology, **Gemma Cervantes**, **Joan de Pablo**, **Silvia Sorolla**, **Beatricce Coltelli**, **Livia Mazza**, **Juanjo Martín**, **Carme Margelí**, **Josep Antequera**, **Carles Estévez**, **Enrique Socias**, **Nick Dimitriadis** (E 29)
28. An EIP In My Back Yard: the case of Chamusca's Eco Industrial Park, in Portugal, Ines Costa, **Paulo Ferrao** (E 29)
29. A Financial Analysis of Eco-Industrial Parks, **Laura Dent** (E 29) *– Cancelled*
30. Competitive intelligence and industrial ecology for the sustainable development of the industrial and harbour area of Fos sur Mer (France), **Guillaume Junqua**, **Moine Hervé**, **Thomas Olivier** (E 29)
31. Development of Industrial Complex Energy Optimization Method For Eco-Industrial Park (EIP), **Sang Hun Kim**, **Song Hwa Chae**, **Sung-Geun Yoon**, **Sunwon Park** (E 29)
32. Eco-Industrial Urban Development: Kansas City Regional By-Product Synergy Initiative, **Mook Han Kim** (E 29)
33. Porto Marghera Case Study and Industrial Ecology: from Risk to Opportunities, **Ilda Mannino**, **Marian Chertow**, **Ignazio Musu** (E 29)
34. Options for aquaculture and drying processes in the Mongstad EIP, **Martin Myrvang**, **Jan Ove Evjemo**, **Anders H. Strømman**, **Christian Solli**, **Edgar G. Hertwich** (E 29)
35. Eco Industrial Parks in NRW, **Veronika Wolf** (E 29)
36. Exploring the Ecological Analogy: Testing connectance and biodiversity for use in industrial ecology, **Ramsey Wright**, **Ray Cote** (E 29)
37. Green supply chain management practices – influence and motivation for adoption, **Magali Delmas**, **Vered Doctori-Blass** (E 30)
38. Identifying the Relative Importance of Implementation Strategies in Green Supply Chain Management (GSCM) Practices via Fuzzy Analytic Hierarchy Process (FAHP), **Chia-Wei Hsu**, **Allen H. Hu** (E 30)
39. As good as new - reprocessing/remanufacturing of used goods and their trigger for innovations within a supply chain, **Renate Huebner** (E 30)
40. Development of Material Flow Cost Accounting for the Recycling Chain Management, **Toru Matsumoto**, **Manabu Shibata** (E 30)
41. Strategic Resource Mapping – A Modelling Approach for Resource flows in Textile Industries Supply Chain, **Georg Mueller-Christ**, **Carsten Gandenberger** (E 30)
42. Application of FMEA to Establish a Risk Assessment Framework for Parts and Components in Green Supply Chain Management, **Wei-Cheng Wu**, **Chia-Wei Hsu**, **Allen H. Hu** (E 30)
43. Environmental Standards and Certification – Case study of the wine industry, **Magali Delmas**, **Vered Doctori-Blass** (E 31)

Theme F: Technology and Engineering for IE

44. Best Use of Natural Gas: A Life Cycle Comparison of NG/LNG Consumption for Different End Uses, **Paulina Jaramillo**, **W. Michael Griffin**, **H. Scott Matthews** (F 32)
45. North American potential for production of diesel fuel from bio-based feedstocks, **Bryan Tripp**, **Heather MacLean** (F 32)
46. Vapor Grown Carbon Nanofibers- A Life Cycle Energy Analysis and Environmental Impact Assessment, **Vikas Khanna**, **Bhavik R Bakshi**, **L. James Lee** (F 33)
47. Gherkins, Ipods, and Nalgenes, **Eric Nay** (F 33)
48. The potential amounts of recovered materials from waste electrical and electronic equipments using self-disassembling fastener, **Eiji Yamsue**, **Kenichi Nakajima**, **Ichiro Daigo**, **Kazuyo Yokoyama**, **Wakana Tamaki**, **Seiji Hashimoto**, **Nguyen Duc Quang**, **Hideyuki Okumura**, **Keiichi N. Ishihara** (F 33)
49. Exploration of Technological Change of Japanese Waste Management Industry, **Naoya Abe**, **Shinsuke Murakami** (F 34) *– Cancelled*
50. Technological Innovations in North American Panel Industry, **Emmanuel Ackom**, **Paul McFarlane** (F 34)
51. Bayesian Material Flow Model, **Dominic Albino**, **Jeffrey Dahmus**, **Timothy Gutowski** (F 34) *– Cancelled*
52. Novel Polymer Recycling Processes on a Local Scale, **David Morgan**, **Claire Barlow** (F 34)
53. Radio Tracking of Products in Recycling Chains, **Valerie Thomas**, **Dexin Luo**, **Saritha Vishwanathan** (F 34)
54. Pilot scale experiments of SMRH, a new technology of cleaner production of diosgenin from Dioscorea Zingiberensis, **Wang Yanxin**, **Zhihua Yang**, **Yanxin Wang**, **Caixiang Zhang**, **Hui Liu**, **Yan Hong**, **Jianguo Bao** (F 34)
55. Possibilities and Challenges in Establishing Sustainability Informatics: Creation of Data and Informatino Commons, **Masaru Yarime** (F 34)
56. Process Design and Analysis based on Regional Toxicological Impacts, **Xiaoping Jia**, **Wei Chen**, **Fangyu Han** (F 35)
57. Visualization of value chains – why sankey diagrams are so popular!, **Martina Prox** (F 35)
58. Combining Pinch Technology with Artificial Intelligence Method for Energy-saving, **Shuguang Xiang**, **Jia Xiaoping**, **Jin Liqiang**, **Han Fangyu** (F 35)

Theme G: Education and Training

59. Teaching IE at executive level: reasons, objectives, curricula and target audience for the setting of a new international continuing education programme in IE in Lausanne, Switzerland, **Théodore Besson**, **Suren Erkman** (G 36)
60. Sustainable Technology a new extended masters program at KTH in Stockholm, **Nils Brandt**, **Ronald Wennersten** (G 36)
61. Circular Economy and Industrial Ecology Education in Chinese Energy College, **Cai Jianfang** (G 36)

MAPS, DIRECTIONS AND GENERAL INFORMATION

Main Conference Events

Conference sign in and all plenary sessions will take place in the **Medical Sciences** (MS) **Auditorium** (entrance at the southeast corner of King's College Circle). Parallel sessions, poster sessions and refreshment breaks will be in the **Bahen Centre** (BA) at 40 St. George Street (see the campus map on page 23).

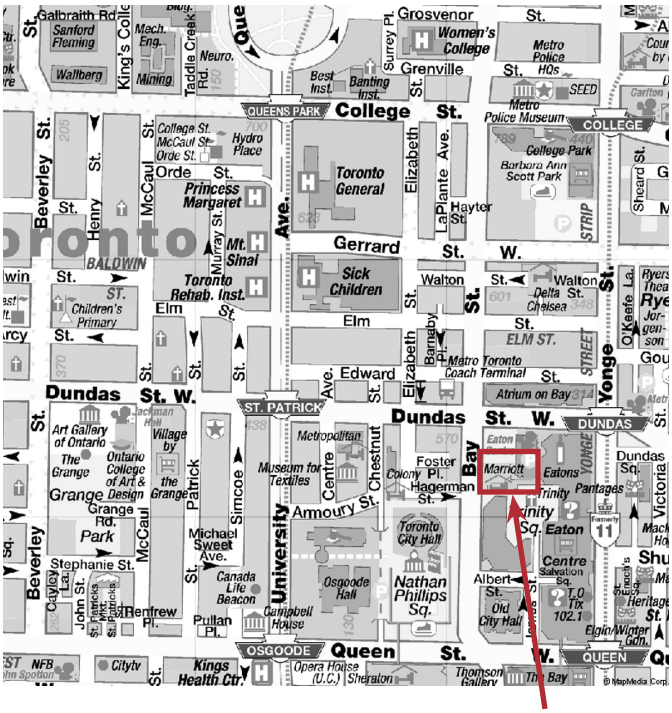
Lunches will take place in the **Great Hall** at **Hart House** (located on the north side of Hart House circle; see top-right-hand corner of campus map on inside cover). The Great Hall is on the west side of Hart House; entering through doors on the south side, go up half a flight of stairs and turn to your right.

Welcome BBQ: Hart House (Sunday, June 17)

The barbeque will take place in the **Great Hall** at **Hart House** (located on the north side of Hart House circle; see top-right-hand corner of campus map on inside cover).

Dinner and Reception: Marriott Hotel Eaton Centre (Monday, June 18)

The **Marriott Hotel** is 15 to 20 minute walk from the south end of campus. From College Street turn south on University Avenue, east on Dundas Street W. and south on Bay Street.
Taxis can easily be hailed on College Street, at the south end of campus.



Boat Cruise: Mariposa Cruise Lines (Tuesday, June 19)

All seven of Mariposa's vessels are docked at Pier 6, at the **Queens Quay Terminal** building located at 207 Queens Quay West (Main intersection - Queen's Quay West & York Street). We will be dining on the Northern Spirit.

There are two routes to the Queens Quay Terminal by public transit (TTC). Either:

1) Walk to the west side of campus and catch a streetcar on Spadina Avenue (#510 to Union Station). The streetcar will travel down to the waterfront and turn left on Queens Quay. Exit the streetcar at York Street (third stop after the left turn). Allow half an hour for this trip.

2) A faster, but more complex trip is to take the subway from either St. George Station or Queen's Park Station southbound to Union Station. From Union Station, both Harbourfront Streetcars/LRT (#509 & #510) will take you to the dock - travel two stops and exit at York Street. This trip takes 20 minutes.

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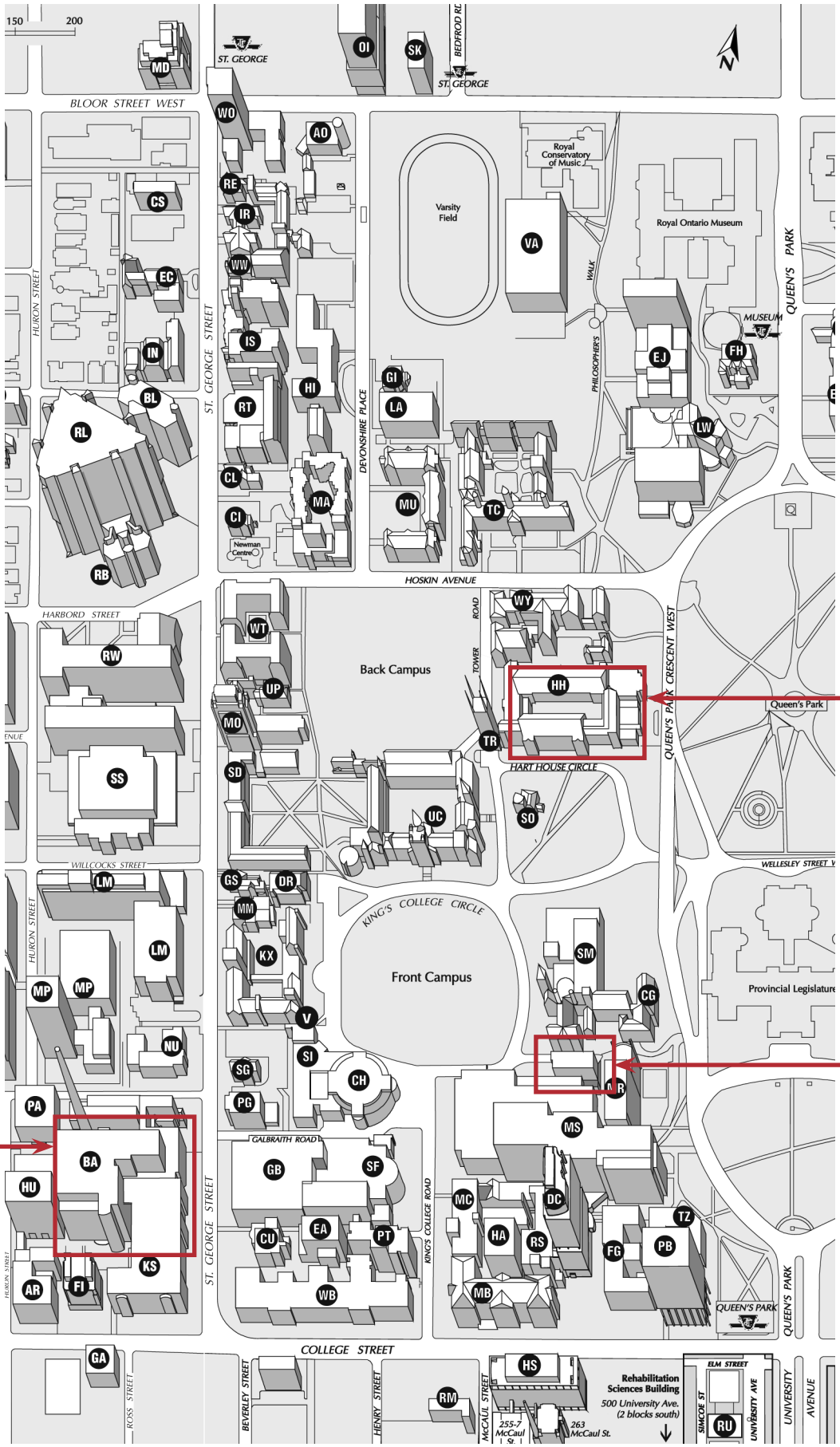
UNIVERSITY OF TORONTO CAMPUS MAP



International Society for Industrial Ecology

The 4th International Conference of the International Society for Industrial Ecology, ISIE

The ISIE Conference Committee wishes to thank all of the volunteers who helped make the event a huge success!

The ISIE wishes to thank our conference sponsors:

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The ISIE is also grateful for a donation to the conference made by General Motors Canada.

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