

**Industrial Symbiosis Eco-Industrial Development Section Update**  
**April 1, 2011- June 20, 2011**  
**International Society for Industrial Ecology**  
Peter Lowitt, FAICP

This update service is provided by the Industrial Symbiosis Eco-Industrial Development Section of the International Society for Industrial Ecology. We welcome your announcements, call for papers and announcements of academic publications, corrections, insights and feedback.

Yale University and the section co-sponsored the 8<sup>th</sup> annual Industrial Symbiosis Research Symposium (ISRS) in San Francisco June 5<sup>th</sup> and 6<sup>th</sup>. Seven teams of researchers from around the world joined forces in an effort to review our knowledge of Industrial Symbiosis and to seek greater understanding of our use of common terms and definitions and how they vary (or do not) from country to country and region to region. Teams included representatives from Europe, another group from Kalundborg, from Japan, from Korea, Yale, Tsinghua China, and International Practitioners. A publication is expected to result from the summary of the work which took place during this intensive workshop.

The newly elected Section board consists of Marian Chertow (Professor, Yale U, USA) , Weslynn Ashton (Secretary) Assistant Professor, Illinois Inst. Technology, USA, Ankit Aggarwal (Student, TU Munich, Germany, Student Member), Professor Shi Han (Treasurer) Assistant Professor, City U of Hong Kong, China , Rachel Lombardi (Research fellow) U. Birmingham, UK and Practitioner, and Peter Lowitt, FAICP, practitioner, Devens Enterprise Commission USA(Chair). The board serves for a two year period from 2011-2013.

Mr. Lowitt called the meeting to order, and began with a round of introductions of the approximately 60 people in attendance. There was good representation of members from North America, Latin America and the Caribbean, Europe and Asia.

- The Chair announced the Board's decision to keep section membership dues as complimentary with membership to ISIE.
- The Chair announced that the Board has agreed to co-sponsor:
  - The ISIE Asia-Pacific meeting and work to establish an EIDC/IS track for that conference (September 14-15, 2012 in Beijing)
  - The 9th Annual ISRS meeting in Tianjin, China (September 13, 2012) – coordinators Prof. Shi Lei (Tsinghua) and Prof. Shi Han (City U Kong Kong).
- Ms. Lombardi announced that NISP will be celebrating its 10th Anniversary next year and will be holding a practitioner's event, in Birmingham, UK on June 12-14, 2012. Space permitting, EID/IS section members may be invited to attend, and more details will be forthcoming. This also happens to be the 50<sup>th</sup> anniversary of Kalundborg uncovering its industrial symbiosis and the two groups are seeking to coordinate their well-deserved celebrations.

- Member-raised issues
  - Mr. Tim Nolan (Minnesota PCA, USA) suggested that there should be greater benefits for practitioners, such as information that could be used in developing EID/IS projects.
  - Dr. Megha Shenoy (ROI, India) suggested that a database of cases from around the world, with highlights of key features, successes would be very useful.
  - Prof. Frank Boons (Erasmus, Netherlands) suggested that proceedings from section meetings and ISRS events be made available to members.
  - Prof. Anthony Chiu (De La Salle U, Philippines) suggested that the section members could come up with topical issue recommendations and policy position papers, as well as resources to enhance relations among practitioners.
  - Mr. Chris Davis (TU Delft, Netherlands) offered that the Industrial Ecology Wiki created by his group could be a good vehicle for inventorying information about different EID sites around the world, and depends on researchers and practitioners feeding accurate information into the site. Currently the organization of the site is for EIPs, but different levels of information (such as known by-product/material exchanges and or links to data exchanges) can also be easily accommodated. Prof. Weslyne Ashton suggested that we ought to be mindful that many symbiosis initiatives are for-profit and the information they are collecting and storing is seen as proprietary.
  - Prof. Gemma Cervantes (IPN, Mexico) suggested that we should have an on line discussion group so that we can continue learning from each other, beyond the face-to-face meetings which happen once a year at these meetings.
  - Mr. Ankit Aggarwal endorsed this idea by suggesting that sending emails to the section email list is very one-sided, and suggested that we utilize or follow what Dr. Ines Costa (IST/3Drivers, Portugal) has begun - an IS group on LinkedIn (with 234 members as of June 14) in which members can post news stories for discussion; there is also a separate list for posting case studies on EID/IS.
  - Prof. Tsuyoshi Fujita (NIES, Japan) suggested a program be structured to enable logistics and funding support for younger researchers, especially PhD students for travel, and exchange of PhD students. They can stay at the department where their colleagues are working on a similar topic.
  - A suggestion was made to establish a consortium for graduate students to present work to senior colleagues and researchers, and to hold separate workshops for students as part of or attached to other conferences.
  - A forum for methodological discussions should be established, to follow what is currently going on among researchers in the EU to create common grounds for collaboration. Dr. Costa suggested that the management policy institute on innovation is an example where several universities meet to discuss a collective approach. She will send the link.
  - Mr. Robin Branson (Qubator, Australia) offered that there are may interesting ideas coming out of this community, with significant commercial potential and

we ought to create a mechanism for helping members to explore and commercialize these opportunities.

- Mr. Nolan urged the group to consider “What are our goals and products, besides academic papers?” He suggested that we should establish goals and deadlines and align our activities to achieve specific results.
- Based on the discussions, three themes emerged. The Secretary will circulate sign-up sheets via email to establish the following committees, who will take charge of creating an effective strategy to deal with each theme:
  - Communications: this committee will work on establishing protocols for communicating with members and be responsible for sending out updates. The group should examine the various existing communications platforms and determine how best to communicate with members of the section and non-members. Ankit has agreed to serve as board liaison.
  - Programming and events: this committee will work on defining (co-)sponsorship of events, assist in planning events; determining ways goals and deliverables for the section, examining ways to fund initiatives such as PhD student exchanges or graduate consortium events.
  - Database and information sharing: this committee will work on determining the best means of sharing information about projects and synergies, utilizing existing platforms or suggesting new ones, and working together to organize this initiative.
- Yes we have our own LINKED IN group! Thanks Innes.  
[http://www.linkedin.com/groups?about=&gid=1845383&trk=anet\\_ug\\_grppro](http://www.linkedin.com/groups?about=&gid=1845383&trk=anet_ug_grppro)  
from Professor Ines Costa
- Here are the direct, unpublished links to the ISIE conference oral and poster presentation abstracts:

[http://isie2011.berkeley.edu/program\\_presentations.html](http://isie2011.berkeley.edu/program_presentations.html)

[http://isie2011.berkeley.edu/program\\_posters.html](http://isie2011.berkeley.edu/program_posters.html)

The abstracts are available online only. Note that you can filter the lists at the top of the page.

Calling all Eco-industrial designers! [The World Design Impact Prize](#) is a biennial designation created to recognise empower and stimulate socially responsible design projects and initiatives around the world. Presented by the International Council of Societies of Industrial Design (Icsid), the [World Design Impact Prize](#) will honor exceptional industrial design driven projects that are making a positive impact on our

social, economic, cultural and/or environmental quality of life. By drawing from the expertise of Icsid's network, this [competition](#) creates an exciting opportunity for members and the general public to play an active role in recognizing and honoring projects and partners that create a better world through socially responsible design. Entries will be accepted through October 5th, 2011. Read more: [The World Design Impact Prize | Design Competitions](#)

## Conferences, workshops, courses and other events

- ReuseConex2012, the 2nd National Reuse Conference & Expo, which will take place in Portland, Oregon on October 2012. Be sure to bookmark the conference website to keep up on the latest info: [ReuseConex.org!](#)
- Sustainable Innovation 11 'State of the Art' in Sustainable Innovation & Design. 16<sup>th</sup> International Conference 24<sup>th</sup> – 25<sup>th</sup> October 2011, Farnham Castle, Farnham, UK.
- 2011 Asia Pacific Roundtable for Sustainable Consumption and Production, Nov. 9-11, 2011 Yogyakarta, Indonesia ([www.aprscp.net](#))
- 2011 Asia Pacific Industrial Engineering and Management Science Conference, Oct , 2011 Beijing, China ([www.apiems.net](#))
- 2011 APBITM-IEEE Summer International Conference, Jul 10-12, DLUT, Dalian, China
- 2013 International Society for Industrial Society Conference, 2013, Ulsan, Korea
- Industrial Ecology Conference 2011: *Sustainable Production and Consumption* November 11-15, 2011 Xcaret, Mexico  
<http://www.zingconferences.com/index.cfm?page=conference&intConferenceID=90&type=conference>
- NISP 10<sup>th</sup> anniversary conference which could include joint celebrations with Kalundborg around their 50<sup>th</sup> anniversary are in the planning stage. According to Peter Laybourn of NISP "the intent of the conference is to develop specific plans around the contribution of industrial symbiosis to major world themes. Emerging headings (not fully finalised) are around ...
  - 1) Development of post disaster and post conflict economies – building more resilient economies
  - 2) Industrial symbiosis as a driver of demand led innovation
  - 3) Rapid deployment of IS across Europe (this will be in response to the then published – September 2011- Resource Efficient Europe Road Map by the European Commission)
  - 4) Regional/Local Economic Development through Intelligence Based Industrial Symbiosis (RED IBIS)
  - 5) Accounting for carbon arising from industrial symbiosis activity and its contribution to tackling Climate Change – aligning the carbon savings with national budgets and carbon trading mechanisms

The principal driving organisations behind the topics are

- 1) World Bank, OECD, UNIDO
- 2) OECD, Technology Strategy Board, UKTI, Universities, DG Research and Innovation
- 3) European Commission (DG Enterprise and DG Environment), European industry bodies such as Plastics Europe, Environmental Technologies Action Plan (ETAP)

- 4) Municipalities, regional development agencies, planners, Birmingham City Council (largest municipality in Europe), DG Regional Policy
- 5) Carbon accountants, carbon traders, Prince of Wales, WWF, OECD, DG Climate Action

Each working group will produce a 'practical' blueprint that will be published post conference. There will also be a 'ceremony' where international Synergies will remove the firewalls between the international programmes using synergy enabling more than 10 programmes across the world to talk to each other and share data and synergies." The conference will be hosted by International Synergies/Birmingham City Council.

- Industrial symbiosis and green chemistry: one's waste is another's resource! At Boston Clean Tech Conf in June: <http://gchem.us/eQQO6f>

## Publications and presentations of interest:

- Backcasting energy futures using industrial ecology by **Damien Giurco a, \*, ; Brett Cohen b; Edward Langham a; Matthew Warnken c**  
**Technological Forecasting and Social Change June 1, 2011.**
- **Decoupling natural resource use and environmental impacts from economic growth** Produced by the International Resource Panel .  
The full report can be downloaded from [www.unep.org](http://www.unep.org). United Nations Environment Programme Division of Technology Industry and Economics, 15 rue de Milan, 75441 Paris CEDEX 09, France.
- Bloggers have begun to link the growth of green jobs with the development of eco-industrial parks and networks as this title illustrates: **Green Jobs Growing: Eco-Industrial Business Parks Increasing Green Career Opportunities**  
Published on April 26, 2011
- A nifty piece entitle **Greenhouse Waste Heat Exchange** from *Queen's University Applied Sustainability Research Group* can be found on line in what they term their Appropedia.
- **How to Green your Business for Growth**, a free guide published in the UK by the Carbon Trust, is now available for downloading. [Green your business for growth](#)
- Nordregio: The Nordic Centre for Spatial Development has a short piece on Kalundborg.
- Harvard Business Review: **The Big Idea: Creating Shared Value** by Michael Porter and Mark Kramer, January 2011. People, this one is worth reading. Take a look and let me know what you think and ponder on how Industrial Symbiosis and Eco Industrial Development fit into their thesis.
- **Progress Toward a Circular Economy in China: The Drivers (and Inhibitors)** by John A Mathews and Hao Tan in Journal of Industrial Ecology, Vol. 15- No.3 June 2011 Pages 435-457.
- **Reclamation: An Eco Industrial Park in Greenfield, Massachusetts** a thesis by Sage Sluter published May, 2011 as part of the graduate degree at UMASS-Amherst Landscape Architecture and Regional Planning Honors project.

- [Eco-Industrial Parks in the Mexico-US Border Region: A feasibility study](#) by Saul Perez Duke University 2007.
- Eco-industrial park: from theory to practice Case study in Kinh Mon District, Hai Duong Province, Vietnam by [Nguyen, Thi Hoang Lien et al.](#) in 2010 Vol 27 No 1 published by Tạp chí Khoa học pages 1-12.
- The Application of Green Buffers for Eco-Industrial Town the case study of Rayong, Industrial Estate in Rayong, Thailand. By [Ariya Aruninta](#)

## **Eco-Industrial Development and Industrial Symbiosis in Practice:**

Eco-Industrial Projects:

**COUNTRY: USA**

**Pennsylvania:** Keystone Industrial Port Complex, a 2400 acre former US Steel property in Bucks County, PA announced that Steel Orca will be siting a 300,000 data processing facility within the Eco Industrial Park.

**North Carolina:** Reventure Park in Charlotte has scaled back its plans to only generate 10 MW of electricity on site so that it is no longer attempting to use Mecklenburg County's waste as a fuel source for the plant. Efforts to rezone land to specifically allow eco industrial park uses for the Reventure Park remain on hold.

**Massachusetts:** The City of Boston's Newmarket Eco Industrial Zone web site lists an array of programs the city has mustered to enhance innovation and competitiveness for the district. Sage Sluter presented his honors thesis calling development of an eco industrial park in Greenfield, MA on the site of the former Bendex/Repal factory on Laurel Street extension to town officials in early June, 2011.

**Ohio:** City of Hudson. The ProgressOhio Blog reports: "A grant has been given to the city in the amount of \$710,000 for a road construction project that is expected to bring 300 new full-time jobs to the area. The project will also increase the acreage of the Seasons Road Commerce Center (SRCC), land that will be shared by local manufacturers to reduce costs associated with waste management, while pursuing eco-friendly alternatives for industrial practices. "I am pleased that the state recognizes the benefits of eco-industrial parks and is investing in projects that are cost efficient and will help reduce waste and pollution," Rep. Sykes said. "This project brings jobs and forward-thinking eco-friendly solutions, which is exactly what we need to revitalize our economy."

The park is slated to become the first industrial park which fully utilizes green construction practices. In addition to providing space for sustainable development projects, the SRCC is expected to bring a number of new jobs to Hudson. The first tenant for the park has a process that will recycle 3-7 plastics and convert them to oil. This

tenant's plant will cost between \$8,000,000 and \$10,000,000 and is projected to employ 140-150 employees within 3 years. A second tenant will remove an estimated 730,000 tons of municipal solid waste from landfills while generating 33,000,000 gallons of ethanol per year and is projected to employ 125-130 full-time employees within 3 years. The eco-industrial park will be the first in Ohio and represents an innovative trend in community waste management.”

**Illinois:** Chicago where a coal gasification plant is proposed for the southeast side of town wrapped in an 140 acre eco-industrial park package has caused a media stir in the windy city. State legislation supporting the park through the long term purchase of gas from the plant passed the legislature and needs gubernatorial signature in order to proceed. The company proposing the plant calls the project an Eco Industrial Development. The governor vetoed the bill and after minor amendments the legislation was once again passed through the legislature. The Leucadia National Corp. plans to build \$3 billion plant on city's Southeast Side once the Governor signs the bill.

**Washington:** The South Kitsap Industrial SubArea Plan (Bremerton, Washington) dated June 2011 calls for developing a vibrant economic base as a model of sustainability and includes goals which call for the pursuit of eco-industrial development.

**Puerto Rico:** Most promising eco-industrial park on eco-efficiency in Latin-America: A case study of Guayama Eco-Industrial Park by [Machteld van der Hek | Mathilde Vlieg](#) students from TU Delft.

**Virginia:** Virginia Beach. Plans for a Chatham Eco Industrial Park are shown on the Groundworks web site. An integrated light industrial and residential project is being proposed.

**European Union industrial policy must focus on energy and resource efficiency.** March 2011. The European Parliament today adopted the Lange report on "Industrial policy for the globalised era" responding to the EU 2020 flagship initiative issued in October 2010 by the Commission. After the vote, Green industrial spokesperson Reinhard Bütikofer said: "The Parliament has today supported a set of actions to promote the competitiveness of European industry. I welcome the recognition that, to face the crisis and globalisation challenges, energy and resource efficiency must be the basis for European industrial renewal. "Sustainability has to be recognised as a central aspect of the so-called 'competitiveness proofing' and 'fitness checks' to be implemented by the Commission as part of its better regulation initiatives."The report rightfully calls for closed-loop industrial systems, greater resource productivity, durability and re-use, recycling and remanufacturing. “The report also calls for instruments to foster the development and growth of eco-innovative SMEs, as well as the development of eco-industrial parks.”

### **European Union Mediterranean Innovation Projects**

Eco Mark Project: ECOMARK wants to develop a GREEN MARKETING, specifically for Eco Industrial Parks (EIP) and generally for Industrial Areas (IA), with the aim of

favouring the competitiveness of SMEs and the a more sustainable community development. The Green Marketing principle is based on sustainable (Green) products, processes and services, and is oriented towards the external communication. The five regions involved in the ECOMARK project are: Emilia Romagna (IT) ; Côte d'Azur (FR) ; Comunitat Valenciana (ES) ; Western Greece – Thessaloniki (GR); and Slovenia (SI) .

**COUNTRY: Thailand**

**COUNTRY: Malaysia**

**COUNTRY: United Kingdom**

**COUNTRY: Australia**

Innovate South Australia hosted a series of workshop lead by Peter Lowitt, FAICP and Andreas Koenig of EcoIndustry.org to assist businesses and government in developing plans for eco-industrial parks in the northern and southern suburbs of Adelaide in early May. Gary Foster, from NISP in the UK visited down under May 24, 2011 and made a pitch for developing by-product exchange networks in Australia as well.

**COUNTRY: Philippines**

The Laguna Lake Development Authority in Cabuyua, Laguna held a recycling networking event under the title, eco-industrial networking, as part of their celebration of earth month April 29, 2011.

**COUNTRY: Vietnam**

From the Ministry of Natural Resources and the Environment of Vietnam's website: "At the National Roundtable Conference on Cleaner Production and Sustainable Development held on May 26-27 in Khanh Hoa, experts, scientists and managers discussed a range of eco-industrial park models. In Vietnam, the Linh Trung 1 Export Processing Park 1 in Ho Chi Minh City and Nhon Trach 2 Industrial Park in Dong Nai are considered as trial models of green industrial development."

Eco-industrial parks are still a new concept in Vietnam. At present, there are some industrial parks in the south operating according to this model. The 62ha Linh Trung 1 Export Processing Zone in Ho Chi Minh City was established in 1995. There are 26 businesses operating in the zone, among which five companies have applied methods to reduce waste emitted into the environment including Fuji Impulse Company Limited, Vina Dany Company, Viet Nam Top Vision Industries Company Limited, J&Y Electric Company Limited and Super Giant Industrial Company Limited. Those companies have collected waste and recycled it. Theodore Alexander Company and Super Giant Industrial Company exchange their waste. Wood waste of the Theodore Alexander Company is collected by Super Giant Industrial Company to supply for its furnaces. All production facilities in the Linh Trung 1 Export Processing Zone sell their waste to the Sepzone Linh Trung Joint Venture Company or other waste collectors.

The Nhon Trach 2 Industrial Zone was established in 1997 on 347ha in the communes of Hiep Hoa and Phu Hoi, Nhon Trach District, Dong Nai Province. The zone focuses on garments and textiles, mechanical manufacturing, construction material production, wood processing, foods, chemicals, electronic equipment and electrical household appliances. The industrial zone eliminates 14,000cu.m of waste water per day, 96

percent of which is from seven garment and textile companies. About 970 tonnes of solid waste are emitted every month, of which 840 tonnes are non-toxic. The intensive waste water treatment system discards 200 tonnes of mud per month. As a garment and textile eco-industrial park, the management unit is trying to reduce environmental pollution through cleaner production methods. The amount of waste water has been reduced from 14,000cu.m per day to 9,000-11,000cu.m per day. Electric consumption dropped by 37,000kWh per day with chemical use reduced by 10-14 percent. In addition, a network to exchange waste carton paper, cloth and fiber has been established to serve carton box and cloth production. A waste exchange network for plastic and paper outside the zone has also been built. Solid waste and waste gas are treated. After being treated, waste water will be recycled to supply hygiene equipment at worker dormitories (240cu.m per day) and to water plants (500cu.m per day).

It is obvious that eco-industrial parks can raise economic value and reduce negative effects on the environment thanks to improving the efficiency of natural resources exploitation and lowering wastes.

Vietnam has many advantages to develop eco-industrial parks, especially in large industrial zones in Hanoi, Ho Chi Minh City, Dong Nai and Binh Duong. However, to develop this type of industrial parks, policy development plays an important role.

**Thu Huong**

#### **COUNTRY: Canada**

Regina, Saskatchewan (REINA) Regina Eco - Industrial Network Association, held a workshop to assist businesses going green June 5, 2011. The REINA web site goes through a number of possibilities for businesses thinking of locating within the Ross Eco Industrial park.

Fort McMurray, Alberta. This June the spec developer of the first lot in the TaigaNova Eco-Industrial Park announced that it is the new home of RSC Equipment Rentals.

Olds, Alberta announced that the Olds Institute for Community and Regional Development has funded an Eco Industrial Park plan for the community. In Vancouver the McBride Eco Industrial Park will be the site of ecoTech Energy Groups Combined Heat and Power Energy generating station. Plans include greenhouses, aquaculture and cold storage all fueled by the CHP plant. The Edmonton Journal announced that Fort McMurray plans to develop an eco-industrial park. The Tilbury Eco Park in North Vancouver Regional District is producing a quarterly newsletter, the Tilbury Eco Log. Its first publication was this quarter.

#### **COUNTRY: Switzerland**

Sierre/Crans-Montana region has been working to apply industrial ecology in the region since the turn of the century. This work includes a 2008 effort to address eco-industrial

development and industrial symbiosis opportunities in the region. The Sierre web site contains more information on this project.

**Country: Norway**

**COUNTRY: Denmark**

As part of Green Week, Kalundborg held an event on May 25, 2011 entitled Industrial Symbiosis - Getting More with Less with section member Martin Anderson presiding.

**COUNTRY: Brazil**

A high level delegation of Brazilian officials visited the UK in March to find out more about NISP and its programs.

**COUNTRY: China**

Beijing Economic-technological Development Area, has obtained approval from China's Ministry of Environmental Protection, the [Ministry of Commerce](#) and the [Ministry of Science and Technology](#) to become the national eco-industrial demonstration park on May 6, 2011.

Taipei. Academia Sinica, the developer of a new biotech park in Nangang received a green light from the Environmental Protection Administration after completing its Environmental Assessment. They were instructed to review integrating eco-industrial concepts as one of the alternatives for the park.

**COUNTRY: Japan**

The Economist Magazine ran a headline in their April 28, 2011 Tokyo edition entitled "Cloud with a Green Lining" addressing the opportunity to integrate green strategies, amongst them industrial symbiosis and eco industrial development, into the disaster recovery planning going on in Japan.

**COUNTRY: Germany**

**COUNTRY: Hungary and Slovakia**

Reprowis, a joint program between Hungary and Slovakia (Reducing Production Waste by Industrial Symbiosis) REPROWIS - The general aim of the project is the reduction of production waste and the promotion of the innovative techniques of waste management. The specific objectives of the project are the compilation, writing of studies in connection how much the idea of cleaner production and industrial ecology are known and spread among SMEs in some of the border counties of Slovakia and Hungary; the creation of plans for innovative industrial symbiotic actions (waste management) for the reduction of production waste among SMEs ; and the organization of seminars and conferences in the topic of industrial symbiosis and industrial ecology. The main target groups of the project are the representatives of small and medium size companies located in the bordering regions of Slovakia and Hungary, and the decision makers of both countries.

**COUNTRY: India**

Manesar announced its plans to become a pilot site for the nation's first eco-city pilot initiative, developed jointly with Japan. Toshiba released its pre-feasibility report on the project in late April, 2011.

At the Gujarat Cleaner Production Centre (GCPC), that is working with GIZ on behalf of the Gujarat Industrial Development Corporation (GIDC), environmental staff have been appointed to cater to eco industrial development activities. For demonstrating application of eco industry park principles in existing industrial parks, the industrial parks at Vatva and Noroda have been taken up. Work has been initiated for preparing Environmental Information Reports for these two parks. Also, work has been initiated for undertaking Environmental Audit in a few selected industries in Naroda Industrial Estate.

THIRUVANANTHAPURAM – according to Hindu online newspaper, the state is drafting a new green industrial policy directed at making SME's better environmental performers.

### **Professional Changes:**

Congratulations to new PhD's Ines Costa and Guillame Massard!