Industrial Symbiosis Eco-Industrial Development Section Update
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International Society for Industrial Ecology
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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.

Registration opens February 16, 2011 for the ISIE Conference in Berkeley, California June 7-10, 2011. There is a conference track devoted to industrial symbiosis and eco-industrial development. Arrangements are underway to have a IS Research Symposium prior to the main conference. We hope to provide more information on this forthcoming event in this column, on our web site and via email as it becomes available.

Conferences, workshops, courses and other events

- In February, the location of ReuseConex2011, the 2nd National Reuse Conference & Expo, which will take place in October 2011. Be sure to bookmark the conference website to keep up on the latest info: ReuseConex.org.
- 17th Annual International Sustainable Development Research Conference Moving Toward a Sustainable Future: Opportunities and Challenges. The track (#5) on bridging organizations will feature industrial symbiosis and eco-industrial development presentations and is organized by Abhishek Agarwal. May 8-10, 2011 Columbia University, New York, NY, USA Website:isdrc17.ei.columbia.edu; Email: ISDRC17@ei.columbia.edu
- Sustainable Development in the Minerals Industry, June 14-17 Aachen, Germany.
- 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)

Publications and presentations of interest:

- “Research on the Stability of Eco-Industry Chains” by Jingfu Guo & Wenzi Cui School of Economy & Management, Dalian Nationalities University, Dalian 116000, China. E-mail: drguo@dlnu.edu.cn www.ccsenet.org/ijbm

- Industrial Symbiosis for the development of Biofuel Production Author: Michael Martin; Linköpings Universitet.; Linköpings Universitet a very interesting dissertation which can be downloaded as a pdf. A nice piece of work.
- MATERIALS SELECTION IN A ECO-INDUSTRIAL PARK FOR AN ENVIRONMENTALLY-CONSCIOUS DESIGN by B. De Benedetti1, S. Rollino1, G. L. Baldo2, F. Rutter3 1Politecnico di Torino, Italy, debene@polito.it 2 Life Cycle Engineering, Torino, Italy, baldo@studiolce.it 3Granta Design Ltd, Cambridge, UK, fiona.rutter@grantadesign.com found on the web dealing with a proposed park in rural north west Italy.
- Growth equilibrium analysis of enterprise ecological benefits based on eco-industrial chain by Bing-chun Liu Zhen-zhen Hao Sch. of Manage., Tianjin Univ., Tianjin, China in Industrial Engineering and Engineering Management (IE&EM), 2010 IEEE 17Th International Conference on Issue Date: 29-31 Oct. 2010 On page(s): 1538 - 1541
- Industrial symbiosis in photovoltaic manufacturing by Joshua Pearce Queens University Toronto Canada presented at IEEE conference in January 2011.
- The dynamics of industrial symbiosis: A proposal for a conceptual framework based upon a comprehensive literature review by Frank Boonsa, Wouter Spekkinkb and Yannis Mouzakitisb in the Journal of Cleaner Production 13 January 2011.
- Eco Industrial Solutions, Ltd. has recently put together a listing of their publications available for downloading on their website under news and media.
- Geneva, Switzerland blog page entitled Industrial Ecology and Me provides personal insights into the ongoing work our colleagues in Geneva.
- Sustainable Development in the Process Industries: Cases and Impact *J. Harmsen* (Editor), *Joseph B. Powell* (Editor) March 2010 Wiley


- Eco-Efficiency of High-Tech Industrial Parks: Concept and Evaluation Indicator System by *Wang Jinde Guo Zheng*
  *Shanghai Academy of Quality Management*

- Assessing the Potential of Industrial Symbiosis to Mitigate Greenhouse Gas Emissions by Shi Han *Dept. of Public and Social Administration, City University of Hong Kong, Hong Kong, hanshi@cityu.edu.hk.*

- Eco-Efficiency Assessment for Eco-Industrial Park based on Energy Analysis by Hua Shang and Jiabo Li in Modelling Risk Management in Sustainable Construction Computational Risk 2011.

- Sarah Murray wrote a piece entitled “Alliances that Lead to Creative Industrial Symbiosis” in the Monday November 29 2010 edition of the Financial Times which lauded the work of NISP and International Synergies. Bravo to our colleagues at NISP!

Eco-Industrial Development and Industrial Symbiosis in Practice:

Eco-Industrial Projects:
COUNTRY: USA

Our friend and colleague Andy Mangan of the US Business Council for Sustainable Development provided the following report on USBCSD by-product synergy programs in the US.

**By-Product Synergy: 2010 Summary and 2011 Path Forward**

In 2010, the US BCSD by-product synergy process brought financial gains, along with social and environmental benefits to participating companies and organizations in the Ohio By-Product Synergy Network and the Greater Houston By-Product Synergy Project. Leveraging our collaborative methodology, life cycle assessment tools, and our new Cirrus national database, we've set a strong foundation to take the success of these projects to a national level.

In Houston, over 14,000 metric tons of underutilized resources have been identified in the project’s first year, including: vehicle tires, waste asphalt, acetic acid, polymers and diesel, kiln dust, and aluminum oxide. Fully implemented, these synergies have a potential savings of $4.2 million dollars in waste disposal costs and virgin material purchases.

We've seen similar success in Ohio, where companies including Procter & Gamble, Honda of America, and Worthington Industries worked to see quantifiable benefits identified in 2010, including approximately 230,000 metric tons per year of CO2 avoided and $3.5 million per year in cost savings.
Specific examples include using scrap tires as EPA-approved cement kiln fuel and reprocessing chemical by-products for reuse. These two synergies, analyzed using the Ecosystem Life Cycle Assessment tool (Eco-LCA) developed by the Center for Resilience at Ohio State University, are projected to reduce greenhouse gas emissions by 6,000 metric tons and conserve 184 million gallons of water. Use of Eco-LCA allows quantification of physical ecosystem benefits in addition to traditional reuse values, information that is increasingly of interest to business and policy decision makers. The US BCSD’s new Cirrus database, which uses maps to graphically depict material locations, constituents and synergies in progress for project participants, is proving of high interest to past BPS projects, which are signing on and entering their material data into what will become a national synergy database.

By 2015, our goal is to have 20 robust, ongoing BPS projects around the United States, able to deliver on 5 million tons of CO2 equivalent reduction, 5 million tons of landfill-bound waste diverted, and 2,500 jobs created.

Rhode Island: Tiverton’s Eco Industrial Park will be the site of a 2400KW wind farm according to the US Department of Energy.

North Carolina: Forsite Development, Inc. is the winner of the 2010 Business Innovation Award for its ReVenture Eco-industrial park along the Cawtaba River in Charlotte, North Carolina. The project proposes to redevelop a 667 acre superfund site as an eco industrial park anchored by a 20 MW bio-mass power and thermal energy plant. FCR Recycling will also locate in the park and invest $30 million in a trash to fuel suitable for a 30 MW plant. Neighbors have expressed concerns with the project and its impact on a proposed 11 mile greenway along the Cawtaba River as well as its Superfund designation from past uses on the property. Efforts to rezone land to specifically allow eco industrial park uses for the Reventure Park were postponed until February, 2011.

Minnesota: Section member Tim Nolan made a presentation on Eco Industrial Development to the City of Silver Bay regarding a proposed Silver By Eco Industrial Park. In other eco industrial news from Minnesota, the Itasca Eco-Industrial Park in Grand Rapids, MN received a $1.75 Million Economic Development Administration grant to assist with the parks development. Mr. Nolan made another presentation to the local economic development authority in International Falls, Minnesota on Eco Industrial Development.

Georgia: Northern Forsyth County has received a proposal to rezone 115 acres to accommodate an eco industrial park which will focus on renewable energy and academic research park uses.

Massachusetts: The Devens Eco Industrial Park will be visited as part of a mobile workshop held in conjunction with the American Planning Association’s national conference in Boston April 9-12, 2011. The City of Boston’s Newmarket district is positioning itself as an eco-industrial district and has launched a wiki page to help support efforts to green area businesses and facilitate by-product exchanges.
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 is known as Eco Industrial Development.

Texas: Brownsville was the site of a proposed President’s Council on Sustainable Development eco industrial park that was tried and failed in the late 1990s. Efforts continue to revitalize the idea and to incorporate a regional waste to energy project into the mix, according to an editorial by Kenneth Benton in My Harlingen News dated January 7, 2011.

Nevada: The Reno City Council has approved the sale of a strip of land on East Commercial Row for $1.1 million to Waste Management Nevada for expansion, including a single-stream recycling center. According to RGJ.Com “The sale would be the start of an eco-industrial park approved by the city on land inherited from Union Pacific Railroad as part of the ReTrac railroad trench project.”

Oregon: Wilsonville, Oregon was the site of a February 1, 2011 event which featured ISIE member Tracy Cassavant (EIS), Andrew Mangan (USBCSD) and Bart Gregory of Mithun discussing Eco-Efficiency and the Portland Clackamas County Business Alliance. The metro government has just published a new Eco-efficient employment toolkit which is available on line at www.oregonmetro.gov/communityinvestment

Washington: Port Townsend is reportedly eyeing developing an Eco-Industrial Park according to the local paper. Seattle is also moving toward incorporating Eco Industrial districts into its future growth plans. “The Metropolitan King County Council last month adopted a proposal that calls for a partnership with the City of Seattle (which resides in King County) to create Eco-Industrial Districts in the city and throughout the county. The county and city continue to support the creation of eco-industrial districts.” Seattle’s industrial core is a unique and extremely valuable resource and critical to the long term economic health of the region. The City Council’s interest in (eco-industrial districts) has a dual purpose, both to strengthen our industrial core and to improve the environmental quality of the Duwamish river corridor.”

Puerto Rico: Wanan International announced plans to construct waste to energy facilities as part of eco-industrial parks in collaboration with municipalities. A write up on the conceptual design of the Wanan Eco industrial park can be found at their web site.

New York: New York City the old Brooklyn Navy Yards remains in discussion as the site for a 300 acre proposed eco-industrial park run by BNYDC according to Marin Schloss on her NY Going Green Examiner web site. Previous efforts to launch an eco industrial park in the South Bronx, the Oak Point Eco Industrial Park launched by Sustainable South Bronx and Green Worker Cooperatives has yet to get off the ground.
Vermont: Putney Vermont is the proposed location for Transition Putney – a Green Village Eco Park which proposes to incorporate aspects of eco-industrial development into their project which formed in late 2010. They intend to focus on agricultural value added components, a business incubator and integrate green building design into the redevelopment of the Basketville village area of Putney.

European Union Mediterranean Innovation Projects

*M.E.I.D. – Mediterranean Eco Industrial development is an initiative co-financed by the Programme Med and the European Regional Development Fund. MEID aims at realizing the Mediterranean Eco Industrial Development model facilitating and enabling planning, building and governing sustainable Industrial Areas (IAs).*

The MEID project goals to enhance capacities and decision tools of Competent Authorities to integrate environmental friendly solutions into the Regional and Interregional Development Strategies related to Industrial Policy. The European and Mediterranean SMEs will be the first beneficiaries of MEID, in terms of fostering eco-innovation, competitiveness and transnational cooperation.

**Project activites**

The project activites are organised in a set of components:

- **Component 1 – Communication**: Communication and dissemination of project activites and results among a wide variety of audience (public authorities, scientific community, industrials, SMEs, etc) and through European networks. Project consortium will implement a number of international and national events.
- **Component 2 – Project Management**: Implementation of project management activites.
- **Component 3 – SWOT analysis of Industrial Areas (IAs)**: starting from the exploitation of previous experiences, project partner will present their procedures and construction rules for new Industrial Areas, putting in evidence the environmental, economical criticisms and strengths. Project partner will share their SWOT results to identify the traditional model weakness and to
propose innovative technology, process and materials. The “opportunities” at European level, available Best Available Technologies (BAT) related to buildings will be analysed. A set of internal round tables on swot will be organized.

- **Component 4 – MEID model Definition:** MEID Model will be developed as a decision support system for local authorities to define the IAs location, the area size, the general plan, taking into account mobility, resources, energy and waste management. It will include rules definition for industrial building in order to cover the lack of focus on sustainability in the industrial buildings which present specific characteristics from residential buildings. Two transnational technical meetings will be organized involving external experts.

- **Component 5 – Validation and Pilot test:** The model test will provide indications for improving sustainable standards of IAs and validate the rules to follow in the planning phase. SMEs of sustainable construction, energy, recycling sectors will be involved. Competent Authorities will provide recommendation to integrate into the regional programme indications to incentive the introduction of proposed rules. The foreseen pilot areas are: Apulia (Italy), Ragusa (Italy) and Valencia (Spain). Component activities include training courses, meetings for pilot actions and transnational workshops for SMEs.

**Project impact**

Partners will join efforts to impact on:

- **Territory:** reducing impacts of industrial processes to preserve environment, stimulating SMEs to follow a Life Cycle thinking approach, integrating IAs in local economy.

- **Construction** (lead sector in involved areas): defining a shared strategy to identify constructions standards for sustainable buildings in IAs, boosting SMEs to adopt these rules, testing rules on new construction districts and allowing to identify a new eco-construction industry.
• **Business:** increasing local competitiveness, boosting SMEs’ clusters and transnational cooperation, promotion of eco-industrial areas among SMEs, improving their quality, sustainability, growth and eco-friendly approach.

**COUNTRY:** Thailand  
Plans continue to create eco industrial estates and towns in conjunction with the Industrial Estate Authority of Thailand’s 42 estates across the country.

**COUNTRY:** Malaysia  
Nusa Jaya is the site for the proposed BioXcell Ecosystem Industrial Park which is in the master planning phase.

**COUNTRY:** United Kingdom  
Charlton Lane Eco Park Surrey is progressing through the permitting process. The project proposes to create a waste to energy park and material recycling area. Teeside University and area companies are working with NISP, exploring ways to effectuate zero waste to landfill strategies for area companies. Ceramic experts from the University of Central Lancashire have created a new sustainable material from recycled glass and ceramics which can be used in architecture and interior design.

**COUNTRY:** Canada  
City of Prince Albert, Saskatchewan continues to develop a Green Industrial Zoning District and Park incorporating eco-industrial development practices. The Tilbury Eco Industrial Partnership in the North Vancouver Regional District launched a website in January which promotes their eco-industrial efforts. Ontario East Wood Centre Project continues to hold great potential according to project proponents.

**COUNTRY:** Denmark  
Incibon is operating a large biomass refinery and plant as part of the Kalundborg eco industrial project. They were recently written up on the Biorefining web site in an article entitled “Growing Biomass ideas in Denmark.” It’s interesting to see how the participating firms describe the industrial symbiosis project on their web sites. Check out Stat Oil’s web site as an example.

**Country:** Norway  
The Industrial Ecology students at NTTU have created a blog to share information on industrial ecology events for the university community. IndEcolers for the cooler side of Trondheim.

**COUNTRY:** China  
Binhai New Area reports they are working successfully to integrate the concept of the Circular Economy into their development efforts, integrating industrial ecology and eco-industrial development into their development projects.
Tianjin Eco-City – Keppell Corporation announces plans to work on a green integrated logistics distribution center within the Eco-Industrial Park as well as working on water and waste water projects.

COUNTRY: Japan
Kawasaki officials announce progress toward meeting their goal of becoming Japan’s leading Eco Industrial Zone. Good luck with your efforts and thank you for hosting the section meeting this Fall.

COUNTRY: Germany
GTZ has a number of reports on its web sites regarding eco-industrial projects it has funded in the past and is currently funding. It is worth checking out.

COUNTRY: India
Megna Shenoy reports that in a small industrial area in south India the Center for Industrial Ecology, Yale University and the Resource Optimization Initiative (ROI) investigated existing synergies between companies. We uncovered many spontaneously evolved symbiotic interactions between companies. The full report can be downloaded from http://www.roi-online.org/ongoing_projects.htm; it is in the section on ‘Industrial Symbiosis and Residual Recovery in the Nanjangud Industrial Area’.

Professional Changes: