Mayor Coleman Kicks Off Columbus Green Business Conference

Mayor Michael Coleman (below) welcomed over 200 people on Dec. 15, 2006 to the First Annual Columbus “Get Green” Business Conference. The conference was organized by the Mayor’s Green Team to showcase the success of Columbus area companies that have adopted sustainable business practices. It was co-sponsored by the Center for Resilience, and hosted by the Knowlton School of Architecture at The Ohio State University.

Mike Long, Executive Director of the Solid Waste Authority of Central Ohio (SWACO) outlined his vision for a green industrial park based on the belief that waste from one business can be the raw material or “food” for another. By adopting this concept, known as “industrial ecology”, Mr. Long believes that Central Ohio can ultimately become a zero-waste region without significant reliance on landfill disposal of solid waste. (See Page 2)

Several other speakers described how their organizations are implementing “green” business practices, including Barry McClelland, Senior Manager, Company Facilities and Environmental for Honda of America, and Aparna Dial, Ohio State’s Director for Energy Services and Sustainability. The common theme expressed was that greener practices deliver improved bottom-line business results.

The half-day conference concluded with a keynote presentation by Joseph Fiksel, Co-Director of the Ohio State Center for Resilience. He spoke about the sustainability advantages that companies around the world are realizing from the adoption of green business practices. He cautioned, however, that sustainability-seeking companies must also be resilient by staying agile and adaptive in a world of turbulent change. Dr. Fiksel concluded by discussing the Partnership for Industrial Ecology that the Center has formed with SWACO, which is promoting a systems approach to the design of “waste to profit” collaborative networks similar to the SWACO industrial park (see Page 2).

AEP Joins Resilience Consortium

The Center for Resilience welcomes the newest member of our industrial consortium – American Electric Power (AEP). Based in Columbus, Ohio, AEP is one of the largest electric utilities in the nation, with over 5 million customers in 11 states. AEP has been a leader in taking voluntary actions to mitigate greenhouse gas emissions, and is a founding member of the Chicago Climate Exchange.

Dennis Welch, AEP’s Senior Vice President for Environment and Safety, has joined the Center’s External Advisory Board, along with Bruce Braine, AEP’s Vice President for Strategic Policy Analysis. Mr. Braine will be speaking at two forthcoming Center for Resilience events – the Waste to Profit regional meeting and the Conference Board panel on resilience and sustainability (see Page 4).

Inside this Issue...

Partnership for Industrial Ecology............Page 2
EPA Awards Sustainability Grant.............Page 2
DOE Funds Hydrogen from Coal.............Page 3
Avoiding Brittleness Under Pressure........Page 3
Assessing Supply Chain Resilience.........Page 3
People News and Upcoming Events.......Page 4
**Partnership for Industrial Ecology**

Waste can be converted into profit. This is the basic goal of the Partnership for Industrial Ecology in Central Ohio (PIECO), an initiative led by Mike Long, Executive Director, Solid Waste Authority of Central Ohio (SWACO) and Joseph Fiksel, Center for Resilience. Industrial ecology is a systems approach inspired by the cyclical flows in natural ecosystems – one creature’s wastes become another creature’s nutrients. For example, fly ash from power plants is used as a substitute for cement in concrete.

PIECO is spearheading the re-use of industrial and municipal waste streams at a regional scale that is unprecedented in the U.S. According to Mr. Long, “The mission of PIECO is to promote systems thinking and contribute to economic resilience.” SWACO is using an OSU tool called Eco-Flow™ to optimize the design of eco-industrial parks capable eventually of converting up to 500,000 tons of waste per year into valuable commodities such as metals, plastics, biofuels, building materials, and food-grade CO₂. The Eco-Flow™ system has been developed in the Department of Integrated Systems Engineering under the guidance of Prof. Marc Posner by a team of postdoctoral researchers and graduate students.

PIECO is currently working with the U.S. Business Council for Sustainable Development to test the applicability of Eco-Flow™ to their well-established Byproduct Synergy program. The first application will be conducted in collaboration with Bridging The Gap, a non-profit group in Kansas City that coordinates a regional byproduct synergy network.

*More about PIECO: [http://swaco.org/PIECO.aspx](http://swaco.org/PIECO.aspx)*

---

**Research Leader Post-Doc Position**

**Sustainability Metrics Development**

Center for Resilience is seeking a full-time postdoctoral research leader with strong technical and communication skills to direct a team in developing sustainable design performance metrics for the OSU Medical Center.

**Contact:** Joseph Fiksel – mailto:fiksel.2@osu.edu

---

**U.S. EPA Awards Sustainability Grant**

The Center for Resilience and its PIECO partners have been awarded a $300,000 grant from the U.S. EPA Office of Research and Development. This funding will support a combination of industrial ecology research and public outreach to regional stakeholders. Specifically, the research team will develop a software toolkit that will enable better decision-making by considering the economic, environmental, and social impacts of introducing innovative waste reduction technologies.

Components of the planned toolkit include:

- The Eco-Flow™ system *(see previous story)*
- Life cycle analysis tools, including EPA’s TRACI model for life cycle impact assessment, and Ohio State’s new Eco-LCA™ model, which quantifies industrial consumption of ecosystem services
- Threshold 21, a macro-economic systems dynamics model developed by the Millennium Institute, based in Washington DC.
- Life cycle cost/benefit accounting and multi-objective optimization tools.
- Sustainability metrics tools to enable tracking of performance improvements.

The national grant program, called “Collaborative Science & Technology Network for Sustainability”, focuses on long-term sustainability of resources – air, water, land, energy, materials and ecology – through innovative approaches and community cooperation. The intent is for grantees and EPA to work together in exploring and learning about new approaches to environmental protection that are systems-oriented, forward-looking, preventive, collaborative – and, of course, sustainable.

*For more information about the EPA program: [http://es.epa.gov/ncer/cns/](http://es.epa.gov/ncer/cns)*
U.S. DOE Funds Hydrogen from Coal

The U.S. Department of Energy has announced funding for a $1.6 million Ohio State University project that will promote the production of hydrogen from coal at large-scale facilities while reducing CO₂ emissions. The project is one of six selected as part of President Bush’s Hydrogen Fuel Initiative.

The Ohio State project, led by researcher L.S. Fan, professor of chemical and biomolecular engineering, will develop a process based on a patented calcium-looping scheme to produce high-purity hydrogen from synthesis gas in a single-stage reactor. Pure hydrogen is a potential energy carrier for the future, and it may be produced from hydrogen-containing materials such as water and fossil fuels. Until other methods become available, coal is the most economical source for hydrogen production.

This is one of a portfolio of energy conversion technologies being investigated as part of OSU’s new Center for Clean and Sustainable Energy. Related initiatives include research on advanced energy utilization systems, and comprehensive assessment of policy and technology impacts.

Avoiding Britteness Under Pressure

In a recent interview with the Human Factors and Ergonomics Society, Professor David Woods discussed the emerging field of Resilience Engineering. Says Woods: “The opposite of resilience is brittleness, referring to systems that break down rapidly when they are pushed close to their boundaries or challenged by new events. Analyses of dramatic failures of complex systems, such as the Columbia space shuttle accident, have shown how organizations missed signals that their operations had become more brittle as creeping production pressures eroded the buffers that provided resilience.

“In a resilient organization, management monitors for signs that indicate whether the organization has the adaptive capacity to handle challenging events, and targets investments to increase adaptive capacity despite omnipresent pressures for productivity. Can the organization recharge resilience when buffers are depleted, margins are precarious, processes become stiff, and squeezes become tighter?”

More info at: http://csel.eng.ohio-state.edu/woods/

Assessing Supply Chain Resilience

In a complex and uncertain environment, business enterprises must cope with a continuous stream of challenges, from human errors to technological failures to natural disasters such as Hurricane Katrina. Enterprise resilience, defined by CfR as “the capacity to survive, adapt and grow in the face of turbulent change”, includes both short-term business continuity and long-term sustainability.

According to U.S. Air Force Major Tim Pettit, a doctoral candidate in Logistics Management at OSU’s Fisher College of Business, resilience is especially important in supply chain management. Says Pettit, “Whether in industry or in the military, a supply chain is only as resilient as its weakest link.” Resilient companies try to preserve flexibility in supply and distribution channels, and protect their reputation by monitoring the environmental performance and the labor practices of their contractors.

With the help of Limited Brands, Inc., Pettit has been collaborating with Joseph Fiksel of the Center for Resilience and Professor Keely Croxton of Fisher College to develop a Web-based tool for Supply Chain Resilience Assessment and Management (SCRAM™). The tool consists of a detailed questionnaire designed to evaluate the potential vulnerabilities and capabilities of supply chain operations, and is applicable to both manufacturing and service industries. It is currently being distributed to companies for pilot testing.

For information: Tim Pettit 937-830-9135 mailto:Pettit.65@osu.edu
Cullum Named Chair of International Business Environment Committee

The U.S. Council for International Business, a leading pro-trade group, has named Terry Cullum, director for corporate responsibility and environment & energy with the General Motors Public Policy Center, to be the Chairman of its Environment Committee. Terry succeeds George Carpenter, the retired director for global sustainable development with Procter & Gamble.

Mike Long Recognized as Trendsetter

Mike Long, Executive Director of the Solid Waste Authority of Central Ohio, was recognized by Public Works magazine as a 2006 Trendsetter for formation of the Partnership for Industrial Ecology in Central Ohio, which seeks to transform wastes into valuable byproducts (see Page 2).

For a list of Center for Resilience Advisory Board members: www.resilience.osu.edu/resources.html.

Upcoming Events

Waste to Profit: Exploratory Meeting Hosted by The Scotts Miracle-Gro Company
April 12, 2007     Marysville, OH

The purpose of this meeting is to explore the potential business benefits of converting wastes into profit streams, and to discuss how regional industrial ecology networks might be established in Ohio and neighboring states. Speakers include Rich Martinez of Scotts Miracle-Gro, Bruce Braine of American Electric Power, Mike Long of SWACO, and Andy Mangan, Executive Director of the U.S. Business Council for Sustainable Development.

Conference Board: Business and Sustainable Development Conference
May 31, 2007     Washington, DC

The Center for Resilience will present a panel session on Resilience and Sustainability, moderated by Joseph Fiksel, and featuring Advisory Board members Bruce Braine of American Electric Power, Terry Cullum of General Motors, and Tom Hellman of Limited Brands. www.conference-board.org