



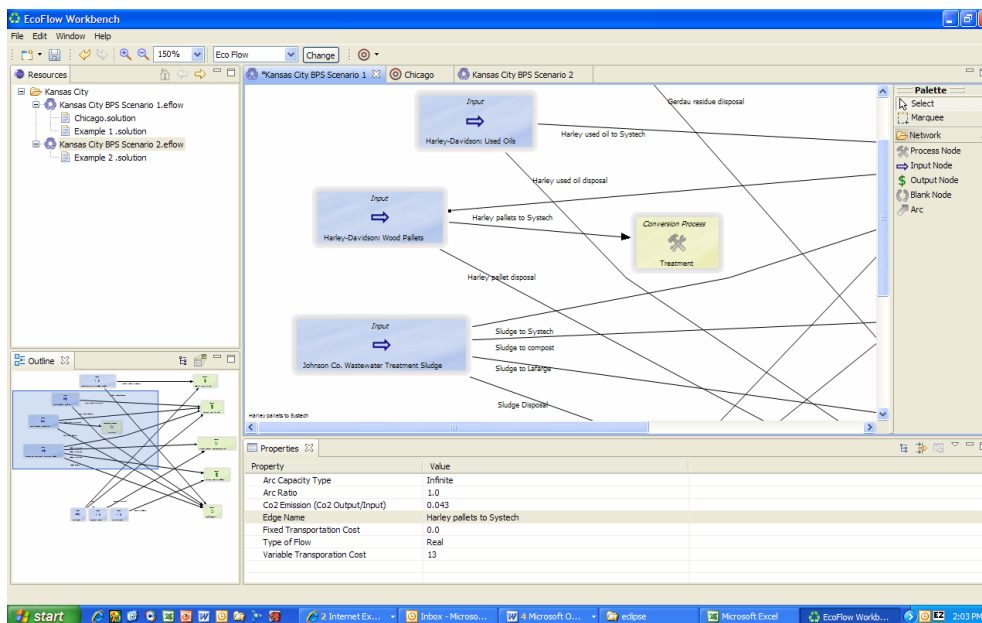
Eco-Flow™: Material Flow Network Optimization

The Center for Resilience at The Ohio State University has developed an innovative decision support tool called **Eco-Flow™** that enables design and reconfiguration of material flow networks to maximize both profitability and waste reduction. This software tool can be customized to represent any multi-facility network, and offers a highly intuitive visual interface.

Eco-Flow™ is part of a toolkit for **industrial ecology**, a process systems approach that mimics natural cycles, converting waste into “food”. For example, fly ash from coal-fired power plants is routinely recycled into building materials. When practiced by a regional cluster of companies, industrial ecology can produce significant economic and environmental benefits. The toolkit includes methods for quantifying these benefits and for evaluating impacts of new policies.

While the industrial ecology concept is attractive, it is challenging for companies to get started in forming networks that cut across many different industries. **Eco-Flow™** makes it possible to rapidly determine the best options for material utilization, even with hundreds of processing nodes. It can maximize profitability for one or more companies, minimize environmental impacts such as greenhouse gas emissions, or combine these objectives. The tool uses a technique called “integer programming”, which is used to solve logistical problems such as airline scheduling.

The Center for Resilience is applying **Eco-Flow™** in a variety of industrial contexts. One important application is the **Byproduct Synergy (BPS)** process developed by the U.S. Business Council for Sustainable Development. **Eco-Flow™** was piloted by a BPS network in Kansas City involving companies such as Hallmark, Harley Davidson, and Lafarge, and it is currently being used to support the new BPS network in Houston. Over time, the tool can help businesses to develop synergistic relationships that improve resource productivity and shareholder value.



Eco-Flow™ is being used by an industrial network in Houston, TX to explore byproduct synergy benefits.

The software package has an easy-to-navigate visual interface that enables real-time construction and optimization of the network.

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