

**Development of a Mixed-Unit Input-Output Model
for Life-Cycle Assessment**

**Troy Hawkins, Chris Hendrickson, Cortney Higgins,
H. Scott Matthews, Mitch Small**

Green Design Institute, Carnegie Mellon University

The risks associated with releases of heavy metals and other toxic chemicals from products and processes are of great concern for companies, regulators, researchers and society at large. Understanding how and why we use these toxic chemicals can help us to use them more efficiently. Life-cycle assessment and material flow analysis have been applied in an effort to reduce human and ecosystem exposure to anthropogenic heavy metals. An introduction to the role these techniques have played in informing environmental analyses will be presented along with a mixed-unit, input-output model for life-cycle assessment (MUIO-LCA) for tracking metal flows among the sectors of the U.S. economy that has been developed at Carnegie Mellon University. National economic input-output tables developed by the U.S. Bureau of Economic Analysis (B.E.A.) were augmented with additional sectors for explicitly handling physical flows of cadmium, lead, nickel and zinc described by the U.S. Geological Survey. Material usage and environmental releases are estimated for the complete supply chain of goods and services. Preliminary model results for the evaluation of case studies will be presented.

This abstract is intended for presentation in the *LCA and LCM Methodologies* track.