# Evaluating economic and environmental effects of local material flow changes with a regionalized version of USEEIO

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## Abstract

The U.S. Environmental Protection Agency (EPA) has developed and continues to enhance the US Environmentally Extended Input-Output Model (USEEIO). USEEIO is a national life cycle model that combines economic and environmental data to characterize environmental and economic effects associated with the production and consumption of goods and services in the United States. It tracks ~400 commodities and >2000 resources, emissions, and waste types to characterize 20+ environmental and economic indicators. USEEIO is widely used in industry, the non-profit sector, in government and academia for applications such as footprinting and sector-based environmental assessment. EPA is also developing regionalized versions of USEEIO and has developed a model for the state of Georgia.

The EPA, GA Department of Economic Development, and Georgia Tech are now working with interested Georgia communities on using the model to evaluate the potential economic and environment consequences of new development directions through the creation of web applications that specifically address community concerns using the USEEIO model along with local data in the background to support the evaluation.

One strong interest in a Georgia community is related to innovative recovery or alternative use of available materials. This project team will be working with stakeholders in Southeast Georgia to collect data on material generation and new technological improvements involving increased material efficiency to evaluate their consequences using the GA version of USEEIO.

The proposed method for consideration involves creating linkages between these material data and the regionalized IO model, which requires knowledge of: 1. local industries or final uses that are generating the materials, 2. how the materials are currently used, disposed of, or handled and in what region, 3. possible uses of the material to substitute for current industry material or energy requirements, 4. estimates of export of the new material or new products, 5. other technological and environmental changes related to material use and substitution, and 6. the market consequences of scaling up material cycling changes.

We propose the creation of a model in the form of a multi-regional waste input-output (WIO) model, an extended form of the IO model, that retains attributes and thus functionality of an USEEIO model. This methodology will be presented using an example material of interest to the SE Georgia partners.