Actionable Science for Communities

Sustainable Materials Management Prioritization Tool, SHC 3.63.1

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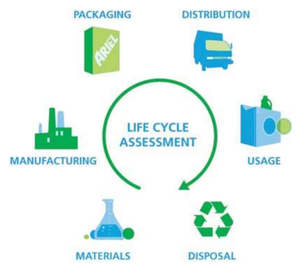
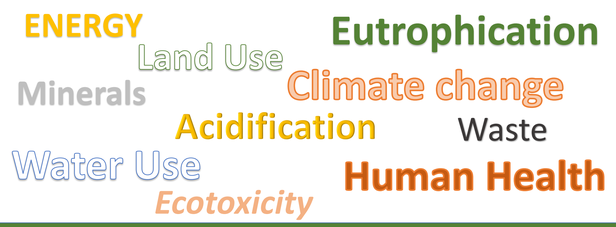
Purpose/Utility of Research

- Determining where to prioritize efforts to manage materials more sustainably is a challenge.
- "The Road Ahead" report (EPA 2009) demonstrated that a full-economy life cycle assessment (LCA) can provide insight into the products/materials of greatest concern.
- The purpose of this research is to *improve* and *expand* upon the previous full-economy LCA modeling approach and incorporate that into a tool called the SMM Tool.

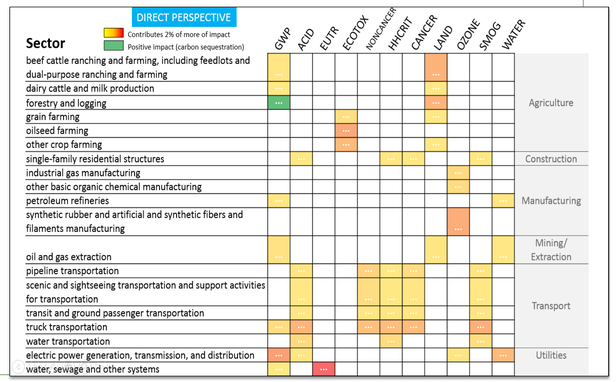


- The LCA model should allow a user to evaluate impacts from the scale of the entire economy to the level of an individual industry, and provide indicators of impacts to air and water quality, resource use, and human and ecosystem health.



Highlights

- The Sustainable Materials Management Prioritization Tool (SMM Tool) will allow a non-expert to assess life cycle environmental impacts of consumption in one or more economic sectors.
- A new national level, cradle-to-point-of-sale LCA model in the form of an environmentally-extended input-output model, **USEEIO**, was developed to underlie the SMM Tool.
- USEEIO is created with a new program called the IO Model Builder
- Results can be viewed from direct (where impacts occur) and final (impacts embodied in the final consumer good or service) perspectives.
- Scenarios analysis capability will be incorporated.



Application & Translation

- A state-specific version of the USEEIO model was created for the state of Georgia called **GA-USEEIO**. Preliminary results were presented to stakeholders in July 2013.
- ORD and R4 will do an in depth study of the food system using the GA-USEEIO model and engage relevant stakeholders in 2017 to discuss and further assess opportunities to reduce environmental impacts.
- The stakeholder process will be a proof of concept and case study for framing SMM with a community using a state-specific USEEIO. Other states have expressed strong interest in this approach.

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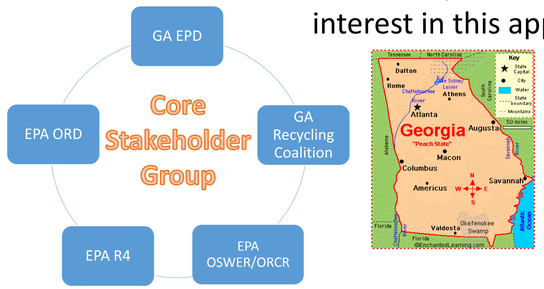

Intended End Users

- The first version of the SMM Tool will be designed for use by enterprises to identify impacts of their supply chains.
- The **USEEIO** model will be able to support other life cycle tools and studies by EPA and external parties. Regionalized versions like the GA-USEEIO will support states and their partners. The IO Model Builder will allow advanced users to create new variations of EEIO models for other purposes.

Lessons Learned

- Developing a national-level model that can be used to model SMM improvement scenarios at various scales involves novel methods and innovative and flexible model design.
- Communicating the complexities of life cycle impacts of the whole economy to stakeholders requires initial background training and using a diverse set of approaches.
- Stakeholders want the model to be as complete as possible – therefore we will be expanding the model to be "cradle-to-grave" to include use-phase and end-of-life impacts.
- Creating and maintaining a national level LCA model requires appropriate investment and expertise.
- Evaluating data quality and uncertainty, and using that in interpretation is critical and a novel application for this kind of model.