



Problem Summary & Decision Context

- Sustainable Materials Management (SMM) Decisions:** a multi-step process that can be made at varying levels from local communities to national policies.
- Tools and data needs are unique to the preferences of the stakeholders.
- Need a consistent approach for making SMM decisions in a life cycle context:

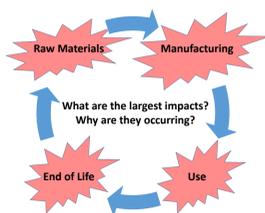
➤ Prioritization

Which materials need the most immediate attention?

Material	Priority Rank	Category 1	Category 2	Category 3
A	?	1	2	3
B	?	2	3	1
C	?	3	1	2

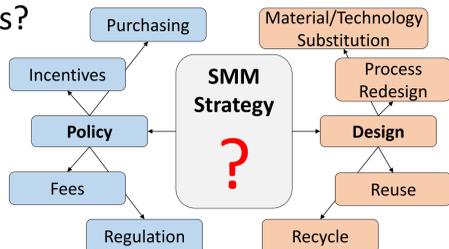
➤ Baseline Assessment

Where are the hotspots in a material's life cycle?



➤ SMM Strategy Development

What are the options for addressing the hotspots?

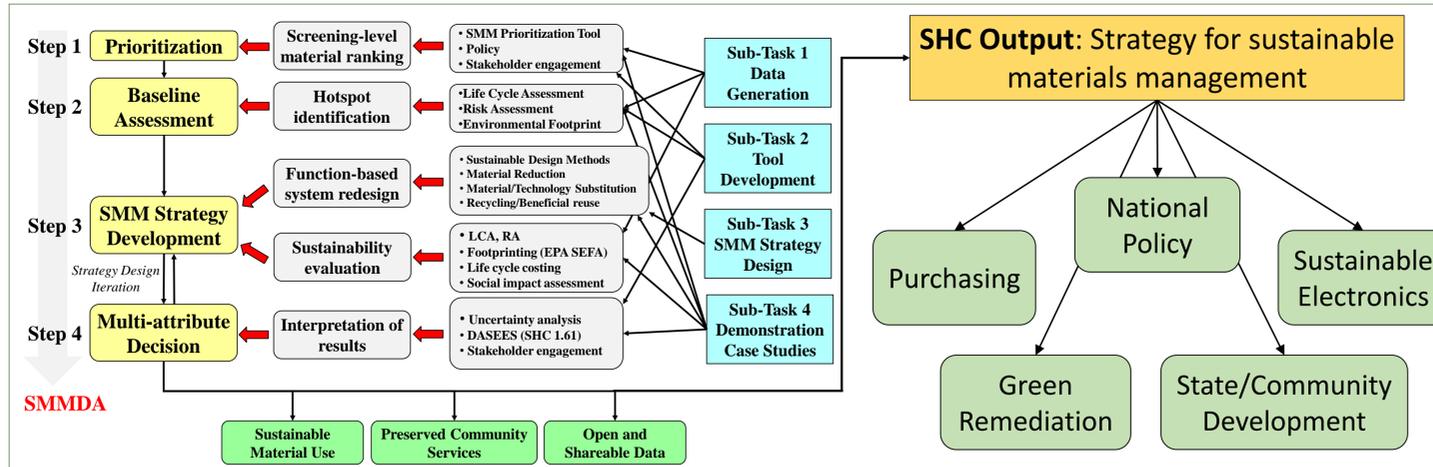


➤ Multi-attribute Decision Making

What does all of this information mean?

Indicators → **Objectives** → **Decision**

Task Overview



- Establish a framework for SMM decision making .
- Generate data and tools to support material prioritization based on stakeholder input.
- Improve assessment and footprinting methods for identifying hotspots.
- Establish guidance for designing SMM strategies.
- Develop approaches to implement structured decision making in SMM using case studies.

Accomplishments

- Initiated the Georgia Pilot, a collaboration between ORD, ORCR, Region 4, and the state of Georgia to implement SMM.
 - Developed an open-source, cradle-to-gate environmentally extended input-output (EEIO) LCA model to support material prioritization at the national and state level.
- Worked with Region 9 and Superfund to update and expand the scope of their SEFA tool for green remediation.
- Convened a sustainable electronics stakeholder group, including Region 9 and OCSP, to study the use of structured decision making (DASEES) in standards development.
- Collaborated with Region 3 and OCSP to evaluate the use of material substitution and/or reclamation in the chemical industry using GEMM.
- Created a web-based version of ORCR's WARM tool to determine the greenhouse gas implications of material management scenarios.

Future Directions

Data and Modeling

- Construction and demolition debris
 - Complete a set of life cycle inventory for release on the Federal LCA Commons
 - Perform a base-line assessment of current C&D end-of-life management in the US
- Finalize a full cradle-to-grave IO LCA model with the ability to track material flows

Tool Development

- Finalize a beta version of the SMM Prioritization Tool
 - Implement the extended IO LCA model
 - Incorporate stakeholder feedback for functionality

Case Studies

- Complete the Georgia Pilot
 - Guide stakeholders through the SMM decision process for a case study of the food sector
- Develop guidance for applying DASEES and life cycle thinking to the electronics standards process using a mock decision process
- Create a sharable knowledge base for SMM strategy design methods

List of Acronyms

C&D – Construction and demolition debris
 DASEES - Decision Analysis for a Sustainable Environment, Economy & Society
 GEMM – Green Engineering Materials Management
 LCA – Life Cycle Assessment
 OCSP – Office of Chemical Safety and Pollution Prevention
 ORCR – Office of Resource Conservation and Recovery
 SEFA – Spreadsheet for Environmental Footprint Analysis
 WARM – Waste Reduction Model