EREF Strategic Research Priorities

Revised 3/28/23

The following 3 key priorities are established to support further research that focused on impacts to the circularity of materials, sustainable materials management, and the mitigation of environmental risk and/or harm. Sub-topics are listed below each main priority in no particular order.

PRIORITY : Climate Change Impacts/Greenhouse Gas Emissions

1. Quantification of greenhouse gas emissions, including direct measurement, modeling, data & methodology
2. Impacts & reduction strategies from waste management collection & disposal options, including waste-to-energy, landfill gas to energy, etc.
3. Impact of waste management activities, including how they relate to broader emissions in manufacturing/re-manufacturing
4. Assessment of climate change and emissions policies/regulations and voluntary changes impacting the waste related activities, including how carbon credits impact decarbonization efforts
5. Impacts due to generation/use/disposal of specific materials
6. Cost implications of climate change impacts and implementing different options

PRIORITY: Emerging Contaminants (PFAS, microplastics, pharma, radioactive materials)

1. Potential impacts that impact landfill leachate disposal/treatment
2. Fate and transport/environmental and health impacts from emerging contaminants, including those managed by waste facilities
3. Best practices/effective management strategics during waste collection and disposal
4. Economic impacts of managing emerging contaminants in waste materials
5. Evaluation of current/proposed policies relative to existing state of practice
6. Identification, quantification and mass flows of waste streams with emerging contaminants and their associated exposure pathways

PRIORITY: Advancing Materials Circularity & Recycling

1. Evaluation/efficacy of policies that impact waste management or circularity, including EPR and bottle bills
2. Assessment of trade-offs between environmental burdens associated with circular priorities (e.g., via LCA)
3. Understanding barriers/benefits experienced across the value chain (e.g. end market, recycled content needs)
4. Impact of consumer behavior/education
5. Identification, quantification and mass flows of specific waste streams, including organics, special, and non-MSW wastes

Waste Types Identified for Focus

PFAS
Microplastics
Pharma
Radioactive materials
Food waste
Textiles
Curbside recyclables (packaging, paper, plastics, metal, glass)
Renewable infrastructure (solar panels)
Electronic waste
Construction
Non-Municipal/Non-Hazardous
Coal/Fly Ash
Drilling/Fracking Waste (e.g. oil/gas waste)
Manufacturing waste (e.g. battery)