EREF Strategic Priorities RFP

Background
The sustainability movement has reached the business models of nearly every industry in the United States, and many companies, municipalities and states have set aggressive sustainability goals that include how waste streams are being managed. The EREF Board of Directors has set an initiative to ensure the research we fund reflects EREF's long-term strategic plan to address all areas of integrated solid waste management, with a strong focus towards research that increased sustainable solid waste management practices.

EREF is an IRS 501(c)3 non-profit organization and is one of the largest sources of funding for solid waste research in North America. EREF is not affiliated with any other entity or group and governed by a duly elected Board of Directors. The Board of Directors is the decision-making body that has responsibility for establishing policies that define program interests and fundamental objectives to be served by the Foundation.

Strategic Research Priorities
EREF's Board of Directors has identified 3 key Priorities that focus on the impacts of solid waste management, circular and sustainable materials management, and mitigating environmental risk and/or harm. The three priorities are listed below. Beneath each major priority area there are three overarching areas that EREF identified as important research gaps and within some of these research gaps EREF has also identified more narrow potential research areas or questions.
EREF's strategic priorities are:

- Climate Change Impacts/Greenhouse Gas Emissions
- Emerging Contaminants
- Advancing Materials Circularity & Recycling.

Definitions and specific areas of interest for each priority are below.

Priority: Climate Change Impacts/Greenhouse Gas Emissions

The solid waste sector contributes to greenhouse gas emissions in a number of direct and indirect ways. EREF is interested in research to better understand the impacts of these emissions, ways to monitor and track emissions, and how the sector can reduce emissions.

1. Quantification of greenhouse gas emissions, including direct measurement, modeling, data & methodology:

- 1a. Efficacy of direct emissions measurement technologies and variables that impact their ability to quantify whole site landfill emissions. Direct measurement research could also include understanding frequency of measurement needed for point source and whole site emissions, impact of wind speed or other meteorological conditions on measurement accuracy, tradeoffs between cost of technology and accuracy.

- 1b. Comparing the accuracy of landfill models and GHG reporting methodologies relative to direct measurement technologies. This could include the development of methods or approaches to validate the accuracy of current models (e.g., HH-6/HH-8, SWICS, LandGEM, CALMIM). This could also include the development of new models or improving current ones to predict emissions.

- 1c. Understanding the contribution of GHG emissions from landfills due to hotspot sources versus typical gas field maintenance/upgrade activities.

- 1d. Confirming accuracy of data used for model inputs and relationship between these inputs and emissions. Potential parameters could include: landfill gas collection efficiency, degradable organic carbon (DOC/DOCf), methane potential (Lo), decay rates (k), levels of exceedances, wellfield density, waste composition, cover tyles, and waste in place.

2. Impacts & reduction strategies from waste management collection & disposal options, including waste-to-energy, landfill gas to energy, etc.

- 1a. Evaluating which operating parameters provide the greatest emissions reductions (e.g., wellfield density, uptime, negative pressure, cover type)

- 1b. Enhancement/development of strategies that minimize GHG emissions (e.g., vertical vs. horizontal gas well designs, working face management etc.)

3. Impact of waste management activities, including how they related to broader emissions in manufacturing/re-manufacturing:

- 3a. Evaluation of emissions reduction strategies and associated avoided emissions that can be attributed to sustainable waste management practices.

Priority: Emerging Contaminants

EREF defines the category of emerging contaminants broadly and it can include but is not limited to issues related to PFAS, microplastics, pharmaceuticals, radioactive materials, odors etc. Emerging contaminants may include issues that are relatively new (microplastics) or well-established issues within the sector (PFAS). EREF is looking for research that advances the knowledge on how these contaminants are impacting the solid waste sector, how these impacts compare to other exposure pathways, and what steps the sector can take to mitigate the risks posed by these emerging contaminants. Some research projects are listed below also see EREF's Key PFAS Research Needs Document here.

1. Potential impacts of emerging contaminants on waste management operations including leachate disposal/treatment, composting facility operations, anaerobic digestion facilities and digestate management:

- 1a. Relative contributions of PFAS to and from receiving solid waste management facilities (e.g. landfills, MRFs, compost facilities).

- 1b. Economic impacts of PFAS management at solid waste facilities.

- 1c. Potential impacts of PFAS on compost or anaerobic digestion facility operations and facility outputs (e.g., produced compost, AD effluent).

2. Fate and transport/environmental and health impacts from emerging contaminants, including those managed by waste facilities:

- 2a. Assess the potential fate and transport/environmental health impacts of PFAS from waste collection through final disposal.

- 2b. What are the exposure pathways of PFAS from landfills and how do these compare with other exposure sources?

- 2c. Evaluate if PFAS sequestered within the waste management system (e.g., landfills composting) and, if so, where it is commonly being sequestered.

- 2d. Comparison of PFAS in and loading to the environment from solids waste relative to other industries and infrastructure (e.g., military bases, airports, manufacturing, water/wastewater, urban stormwater runoff, etc.)

- 2e. Concentrations in products/materials likely to be disposed of (e.g., packaging, food waste, consumer products, water and wastewater treatment sludges) or PFAS by type of waste stream and end point (e.g., MSW to landfill vs. WTE, C&D waste, recyclables to MRFs, organics to compost facilities)

Priority: Advancing Materials Circularity & Recycling

True circularity is not possible without the work of the solid waste sector. The sector is key producer of recovered materials; however, there can be trade-offs associated with these process and economic changes. EREF is looking for additional research to understand these trade-offs and what successful approaches to circularity look like.

1. Evaluation/efficacy of policies that impact waste management or circularity:

- 1a. Measuring and evaluating the effect of extended producer responsibility frameworks.

- 1b. Quantifying the effectiveness of bottle bills.

- 1c. Evaluation of source separated organics management policies and the efficacy of those policies to improve materials circularity.

2. Assessment of trade-offs between environmental burdens associated with circular priorities (e.g., via LCA):

- 2a. Evaluate the potential trade-offs associated with environmental impacts, policy and practice related to different end-of-life pathways.

- 2b. Evaluation of the environmental impacts and associated trade-offs from different vehicle fuel types and collection vehicle operational practices and their associated impact on emissions.

3. Understanding barriers/benefits experienced across the value chain (e.g., end market, recycled content needs).

RFP Guidelines

Submitted pre-proposals **must relate to sustainable solid waste management practices and at least one of our 3 key Priorities.** The Priorities are of equal importance and proposals will not be rated more strongly for one Priority area over another. Subtopics listed within each priority are of particular interest to EREF. Submittals must also meet EREF's definition of solid waste as noted at the end of this RFP.

Definition of Solid Waste Used in this RFP
EREF defines solid waste to include:

- municipal solid waste (e.g., residential, commercial, institutional)
- construction & demolition debris
- certain industrial wastes (e.g., exploration & production waste, coal ash, batteries)
- drilling/fracking waste (e.g., oil/gas waste)
- renewable energy infrastructure (e.g., solar panels, wind turbines) and
- other wastes typically managed by the solid waste industry or generated by the public not included in the above items (e.g., electronic waste, disaster debris, etc.).

This definition does NOT include:

- agricultural wastes (that aren't handled by the waste industry),
- mining wastes managed by the mining industry (e.g., tailings),
- nuclear waste, and
- land applied wastewater treatment sludge.

<u>Topics that do not fit the above definition and are not related to one of the three priority areas will not be considered. Topics that will not be considered include:</u>

- Development of new life-cycle/process models to evaluate solid waste (use or evaluation of existing models is acceptable),
- Evaluating specific applications of pyrolysis/gasification to manage niche/minor waste streams,
- Development of specific gasification/pyrolysis techniques or technologies,
- Using algae to create biofuels from waste,
- Projects focused on agricultural waste or wastewater treatment sludge,
- Projects that primarily aid in the formation or initialization of community programs (e.g., recycling programs, re-use projects, etc.), and

- Research projects with extremely narrow scope (e.g., focused on a small portion of the solid waste stream, benefit a single entity or community, or that cover a very small geographical area with no broader application/scalability).

Pre-Proposal Process for Proposal Submission

All pre-proposals shall be submitted through an online application found. Mailed hard copies and email submissions will not be accepted. ***NOTE: You are being directed to a 3rd party platform called InfoReady. If you have not submitted through InfoReady before, you will need to create an account separate from the EREF website.***

Pre-proposals are REQUIRED prior to submitting a full proposal using the pre-proposal template. All pre-proposals must adhere to the criteria noted and be submitted by the established deadlines. Pre-proposals submitted in response to this RFP that do not fit within the topic areas noted will not be reviewed.