Environmental Research & Education Foundation Issues Targeted Request for Pre-proposals Focused on Recycling

Raleigh, NC (September 4, 2018) – The Environmental Research & Education (EREF) Board of Directors has identified a high priority research topic in the area of residential recycling and has issued a request for pre-proposals on the topic to support the long-term needs and strategic direction of the solid waste field.

Residential recycling is an integral component of an integrated solid waste management system but there are still knowledge gaps revolving around this aspect of waste management. Recycling is significantly affected by human behavior, which is a driving factor in the recovery of materials and program performance. There is a need to understand how to optimize processing, enhance material recyclability, and develop adequate and durable end markets. Beyond these facets, the demonstration of the overall value of residential recycling in terms of sustainability and economics is not well documented.

For the purposes of this RFP, residential recycling is defined as materials (primarily commodity recyclables such as fiber, metal, plastic, glass) that would typically be collected by refuse collection vehicles and transported to material recovery facilities (MRFs) where the collected materials would be processed and sorted. The post-MRF materials would then be utilized by a secondary manufacturer to process them into useful materials of a similar make-up to that of the recycled material. In other words, recycled plastic is re-manufactured into a plastic material, recycled fiber is utilized for paper/cardboard products, and so on. For this RFP, recycling does NOT include thermal or biological conversion of materials (e.g. waste-to-energy, composting, etc.) or wastes that would typically not go to MRFs (e.g. plastic film, food waste, e-waste).

Submissions of scientific research pre-proposals related to residential recycling are invited in the following areas:

- **Human Behavior**
  - source separation
  - bin/signage design
  - consumption patterns
  - education and communications programs (e.g., which are most effective)
  - effectiveness of positive/negative incentives (e.g., rewards programs, competitions, fines, public notices of failure to comply)

- **Collection and Program Performance/Effectiveness**
  - on contamination
  - based on housing type (e.g. single family, multi-family, townhouse, mixed use)
  - based on container type/size, labeling, collection frequency
  - existing program track record and gap analysis
  - effects of changing waste streams, commerce, and new global markets
  - viability of single stream, source separation, and mixed waste processing

- **Definitions, Policies and Regulations**
  - definitions of recycling and the effect on policy
  - mass versus LCA-based goals
  - existing policy, regulations, and government incentives effectiveness given changing global markets (focus on past, present, and future)
o role of sustainable materials management

- **Reducing and Managing Contamination**
  o human behavior impacts
  o expected contamination rate and how to minimize before getting to MRF
  o strategies to manage/minimize at MRFs and economic impacts
  o role of upstream manufacturing practices
  o min/max contamination based on end use/market

- **Technological Innovation & Processing Optimization**
  o capture efficiency through entire chain - MRFs/secondary processors
  o mixed waste processing
  o sorting technology improvement
  o technological advancement and innovation to minimize contamination or convert low-value recyclables into useful products

- **Enhancing Material Recyclability**
  o management of plastic bags (e.g., should they be banned, expand collection and communication, create new markets, cost of expanded management)
  o based on upstream product design/manufacturing

- **Development of End Markets**
  o economically stable end markets
    - primarily for larger volume commodity recyclables (e.g. plastic, fiber, glass)

- **Recycling Value in terms of Economics and Sustainability**
  o true cost of recycling (including costs such as administrative overhead)
  o commodity price volatility
  o viability of single stream
    - effects of labor availability, safety, and container and behavior issues
    - comparison with dual/multi-stream/mixed waste systems
  o cost comparison of using virgin materials compared to recovered materials
    (accounting for differences in geography or other factors affecting costs)

- **Life-Cycle Assessment**
  o demonstrate and rationalize goals, markets, and infrastructure needs
  o whether or not something should be recycled or not based on environmental burden
  o impact of inventory metrics on recyclability (e.g. transport, energy use)

Pre-proposals submitted in response to this RFP should consider the focus areas noted herein. Projects and research previously funded by the Foundation can be viewed on its [website](http://www.erefdn.org). Previously awarded grants have ranged from $15,000 to over $500,000 with the average grant amount in recent years being $160,000. Typical project durations are about 2 years. Research proposals in excess of $300,000 or longer than 3 years should provide sufficient detail to justify a larger budget or duration.
Submittal Deadline
The submittal deadline for this RFP is 5:00 PM EST, December 3, 2018. The full RFP can be downloaded at www.erefdn.org.