Environmental Research & Education Foundation
EREF
Lighting a path to sustainable waste management practices

Press Release

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EREF-Funded Project Uses a Life-Cycle Analysis Model to Evaluate the Environmental Sustainability of Solid Waste Management Strategies

Raleigh, NC (March 7, 2017) – In the future, policies to reduce greenhouse gas (GHG) emissions that affect the type of energy used in the U.S., as well as the cost of energy and emissions, could significantly impact the strategic direction of solid waste management (SWM). SWM systems must proactively adapt to changing waste composition, policy requirements, and an evolving energy system to cost-effectively and sustainably manage future solid waste.

In order to further examine the environmental sustainability and cost effectiveness of SWM strategies, the Environmental Research & Education Foundation (EREF) provided funding to North Carolina State University for a project entitled, "Integrated Solid Waste Management and Its Environmental Sustainability in a Carbon Constrained Environment."

The investigator developed a life-cycle analysis (LCA) model, using the Solid Waste Optimization Life-Cycle Framework (SWOLF), to analyze SWM performance at the individual processes as well as the management system as a whole. This research takes into account implications of GHG mitigation policies and competing SWM objectives (e.g., costs, emissions, and diversion targets).

Results of the case studies showed that GHG emissions can increase with increased diversion. This supports the concept that diversion targets and material disposal bans may actually be counterproductive towards efforts to reduce GHG emissions. The model also found that SWM strategies designed to reduce GHG emissions were more cost effective at reducing GHG emissions than SWM strategies designed to increase diversion.

These results suggest that SWM decision makers should focus on the environmental impacts they wish to reduce, instead of using potentially problematic alternatives such as landfill diversion. A carbon policy affected minimum cost SWM strategies with GHG emission and diversion targets. Additionally, the relative GHG benefits of waste-to-energy (WTE) (and other electricity generating technologies) were dependent on waste composition (e.g., percent of paper and plastic) and electricity GHG intensity (e.g., relative contribution of coal, natural gas and renewables).

Conclusions emphasize that it is critical for SWM decision makers to systematically consider changes to waste composition and generation, SWM policy, the U.S. energy system, and potential future GHG mitigation policies to optimize SWM strategies.

A project description and final report can be found on the EREF website at http://erefdn.org.

Additional information related to this work can be found here:

Solid Waste Optimization Life-Cycle Framework

For more information on this and other projects funded by EREF, please visit http://erefdn.org.

Pre-proposals are REQUIRED prior to submitting a full proposal. The next pre-proposal deadline is June 1, 2017. For more information, including a download of the Pre-Proposal Template, please visit

https://erefdn.org/research-grants-projects/how-to-apply-for-grant/.

EREF is a 501(c)3 class charity that funds and directs scientific research and educational initiatives for waste management practices to benefit industry participants and the communities they serve. For more complete information on EREF funded research, its scholarship program and how to donate to this great cause, visit www.erefdn.org.

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