

One of the most difficult environmental challenges is the cost-effective and environmentally sound management of municipal solid waste (MSW). Efficient use of labor, equipment, and materials and minimization of costs, energy consumption, and emissions are key to building a sustainable MSW management system.



## **Decision Support Tool**

RTI led the development of a comprehensive screening-level MSW decision support tool (MSW-DST) designed to aid in evaluating the cost and environmental aspects of integrated MSW management strategies. It enables users to simulate existing MSW management strategies and conduct scenario analyses of new strategies based on cost and environmental objectives. The tool can model multiple design options for waste collection, transfer stations, materials recovery facilities, mixed MSW and yard waste composting, combustion, refuse-derived fuel combustion, and disposal. In addition to the decision support tool, RTI has produced a stand-alone database that contains extensive data on waste management activities, equipment, and the production of energy and materials.

Other aspects of the tool are that it can be used to identify low-cost ways to meet recycling and waste diversion goals, quantify potential environmental benefits associated with

recycling, identify strategies for optimizing energy recovery from MSW, and evaluate options for reducing greenhouse gases, criteria pollutants, and environmental releases to waterbodies or ecosystems.

## **Applications and Benefits of the Tool**

- The U.S. Navy in the Pacific Northwest is using the MSW-DST to develop and implement an improved solid waste management plan to reduce cost, increase recycling rates, and ensure that environmental goals are being met. With the closing of smaller local landfills and with the transporting of waste by rail to a larger regional site, the Navy is evaluating subsequent changes in cost, energy consumption, and environmental releases. In order to identify more cost-effective and environmentally preferable solutions to a more regional approach for integrated waste management, the Navy is also evaluating options that would combine waste from nearby communities.

- Lucas County, Ohio, is currently developing a 15-year plan for its MSW management system. The analyses and results of RTI's work are helping Lucas County to develop more integrated, cost-effective, and environmentally responsive plans and targeting opportunities for increasing recycling rates, reducing costs, and improving environmental performance. Use of the MSW-DST has benefitted Lucas County by helping the county save money and improve its recycling program.
- The Great River Regional Waste Authority in Iowa is using RTI's tool to evaluate the trade-offs of an integrated collection system versus multiple collection options. Its goal is to evaluate effects of reconfiguring service areas and applying existing systems to them, and to develop a waste management plan for a 50 percent recycling scenario that is to be presented to the state authority.
- The State of Georgia is using the MSW-DST to evaluate regional solutions to integrated waste management. The tool is helping the state quantify statewide benefits of waste management programs, evaluate options for yard waste management, and identify ways to reduce the contribution of solid waste management operations to criteria pollutants in the metro Atlanta area, which is currently a nonattainment region.
- Anderson County, South Carolina, is evaluating the cost and environmental implications of a residential curbside recycling program for its more densely populated areas, as well as setting up a yard waste composting program. The results of this study will assist the county in determining the most cost-effective

strategies for implementing the programs while simultaneously considering environmental performance.

- The Integrated Waste Services Association, in conjunction with the Municipal Waste Management Association, is using RTI's tool to evaluate the effect of improvements in waste management technologies on greenhouse gas emissions in the United States during the past 20 years. Results indicate that although the amount of MSW has doubled, emissions have decreased due to adoption of integrated waste management programs and recycling, better control of landfill gas, and use of energy resulting from waste to energy and landfill gas to energy.



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Information also is available through the project Internet site at

<http://www.rti.org/units/ese/p2/lca.cfm#life>

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