



Preserving Resources,
Preventing Waste



The Economic Benefits of Recycling - WasteWise Case Studies from the Private and Public Sectors

New Jersey WasteWise Business Network - 2013



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Executive Summary

Recycling is well-known for its environmental benefits, which include resource conservation, energy conservation and reductions in water and air pollution, including reductions in greenhouse gas generation, however, it also has significant economic benefits, many of which are often overlooked. Recycling is an important segment of the national and state economy, creates jobs and saves money for generators of waste. The businesses, institutions and local government entities highlighted in this report all understand that recycling makes both environmental sense and economic sense. Since the environmental benefits of recycling are more often the focus of much of the recycling discussion, this report will focus on the economic side of the recycling story and will demonstrate that recycling makes economic sense for New Jersey's commercial, institutional and governmental sectors.

The **New Jersey WasteWise Business Network** promotes waste reduction, recycling and the procurement of recycled products and is a great resource for companies and organizations looking to manage their waste in a more environmentally-friendly, economical and sustainable manner. Visit the New Jersey WasteWise Business Network online at <http://www.nj.gov/dep/dshw/recycling/wastewise/brbn03.htm>.

A Brief Look at the Economics of Recycling

While mandatory recycling has been the law in New Jersey since 1987 there are still some businesses and organizations that are not yet onboard with recycling and do not realize that recycling not only makes environmental sense, but also economic sense. On a national scale, recycling has encouraged the growth of an industry and created jobs. In New Jersey, recycling is an important segment of the state's economy and one that employs approximately 27,000 people. What is even more important to the generators of waste, however, are the dollar savings that can be realized through recycling. Such savings are realized when the avoided cost of disposal, reductions in needed solid waste services and potential revenue from the sale of recyclables are factored into the overall equation. Of course, there are some costs associated with recycling, as there are with all other day-to-day operations overseen by companies and organizations, however, generators of waste will see the economic benefits of a well-run and successful recycling program over time.

The avoided cost of disposal is the amount of money that is saved by not having to send waste to a landfill, incinerator or transfer station for disposal. It will vary depending upon the fee charged for garbage disposal at the facility in your area, but in New Jersey with such disposal fees averaging over \$80 per ton, the avoided cost of disposal can be significant. A successful recycling program will divert many tons of material away from disposal and thus the avoided cost of disposal must not be overlooked when considering the economic impact of your recycling program. The establishment of a well-run recycling program may also enable businesses and other organizations to utilize smaller solid waste dumpsters and to reduce the number of solid waste pick-ups (often referred to as "pulls") made at their locale. Negotiating such changes in the level of solid waste service received with the solid waste hauler servicing your company or organization can also result in considerable cost savings. In addition, businesses and organizations can realize economic benefits as a result of the sale of their recyclable materials. While prices for recyclable material commodities fluctuate as they do for other market commodities, generators may earn revenue from the sale of recyclable material depending upon the specific material, the extent to which it needs to be processed to make it market-ready and worldwide economic conditions.



Case Study - Lockheed Martin Mission Systems and Training, Moorestown, NJ



Lockheed Martin Maritime Systems and Sensors of Moorestown, NJ not only has an office recycling program in place wherein paper, commingled bottles and cans and corrugated cardboard are separated and recycled, but also a recycling program for various components of the construction and demolition waste stream. The latter program was implemented in order to handle the waste generated by the company's recent large-scale construction projects and enabled Lockheed Martin to control and minimize construction project-related waste disposal costs. Lockheed Martin also initiated a food waste composting program in the 2nd quarter of 2011, however, the financial data for this initiative is not yet available. In addition, the company is looking into implementing a projector lamp recycling program in early 2013.

Lockheed Martin's recycling data focuses on the avoided cost of disposal that it realized thanks to their recycling efforts. In 2011, the company realized \$145,562.57 in savings as a result of material being recycled rather than disposed, as follows:

<u>Recycled Material</u>	<u>Quantity Recycled</u>	<u>Recycling Cost Savings</u>
Asphalt	685.00 Tons	\$ 60,204.65
Comingled Bottles & Cans	24.19 Tons	\$ 1,783.77
Concrete	673.00 Tons	\$ 59,149.97
Electronic Scrap	14.05 Tons	\$ 1,235.12
Metal	94.44 Tons	\$ 8,300.33
Mixed Wood and Pallets	89.07 Tons	\$ 4,054.11
Paper and Cardboard	146.93 Tons	\$ 10,834.62

Total Cost Savings (Avoided Cost of Disposal) = \$ 145,562.57

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Case Study - Janssen Pharmaceutical Companies of Johnson & Johnson, Raritan, NJ



Janssen Pharmaceutical Companies of Johnson & Johnson implemented numerous reuse and recycling programs at their location in Raritan, New Jersey and realized **\$85,694 in total cost avoidance savings** in 2011 as a result of these programs.

The company's reuse programs have focused on office furniture, office equipment and computer equipment. In addition, Janssen donated numerous items to Convoy of Hope, a disaster relief agency, including chairs, tables, promotional products, Styrofoam coolers, ice packs, glass jars, and any other items that could be helpful to those coordinating disaster relief efforts.

Janssen's recycling program keeps many tons of material out of the waste stream, thereby helping the environment and the company's bottom line. Included among the materials recycled by Janssen are paper, bottles and cans, scrap metal, plastic, wooden pallets, ink cartridges, computers, polystyrene, kitchen grease and food waste.

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The **Reuse Marketplace**...is a free regional network to find, sell, trade, or give away reusable and surplus items that would otherwise be disposed as trash.

Businesses, institutions, governments, and organizations in the states of Connecticut, Delaware, Massachusetts, New Jersey, New York, Rhode Island and Vermont are eligible to create accounts and to post listings. Anyone is welcome to search or browse the posted items.

The Reuse Marketplace is supported by state agencies and private businesses. The website is administered by the Northeast Recycling Council (NERC), a regional non-profit dedicated to an environmentally sustainable economy through source and toxicity reduction, reuse, recycling, and green purchasing. Visit the **Reuse Marketplace** at www.reusemarketplace.org.

Case Study - Federal Correctional Institution at Fairton, Fairton, NJ



U.S. Department of Justice
Federal Bureau of Prisons

The Federal Correctional Institution in Fairton, New Jersey recycles a variety of materials, including paper, tin and aluminum cans, corrugated cardboard, plastics and scrap metal. The materials are baled at the correctional institution, which not only makes the materials more manageable, but also more valuable. While the recycling of these materials is notable and helps reduce disposal costs at the Federal Correctional Institution at Fairton, the focus of this case study is the facility's on-site food waste composting system that became operational on July 30, 2012.

Both food preparation waste and unconsumed food from cafeteria operations are composted in the system. A carbon source is added to this nitrogen-rich mix and then sent through an in-vessel aerobic composter that was purchased from B&W Organics of Sulphur Springs, Texas for \$49,000. The mix must be maintained in the composting system at the correct temperature and moisture level for 72 hours. It is then removed from the composter and placed in rows to cure. The piles are turned every other day for three weeks. The end result of this process is the production of a nutrient rich compost that is used at the facility in various landscaping applications.

The Federal Correctional Institution at Fairton is recycling 1,000 pounds of food waste per day through its composting system. Thanks to the success of this program, the facility now only needs its 30 cubic yard garbage dumpster emptied every other week instead of on a weekly basis, which has resulted in disposal savings of \$210.00 per week, or \$10,920 over the course of a year. In addition, approximately \$7.00 in fuel and \$67.00 in labor costs are saved every other week as a result of this reduction in the amount of solid waste in need of disposal. Thus, the payback time for the purchase of the composting equipment is 4.5 years based solely on the annual savings in disposal costs. The payback time is just under 4 years when these other related savings are factored into the equation. By producing its own compost, the Federal Correctional Institution at Fairton also saves money in regard to its landscaping materials purchases.

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Case Study - Township of South Brunswick, NJ



The Township of South Brunswick, which is located in central New Jersey in Middlesex County, has always been very progressive in terms of recycling and thus has had a successful municipal recycling program in place for many years. The township's recycling program switched from a curbside dual stream recycling system to a curbside single stream recycling system in 2012. A large variety of paper grades and bottles and cans are collected through the curbside program. In addition to providing curbside collection of recyclable material, the township also operates a recycling depot wherein residents can drop off the materials collected through the curbside program, as well as recyclable scrap metal, appliances, rechargeable and button cell batteries, automobile batteries, tires, used motor oil, antifreeze, empty propane tanks and clean textiles. The recycling depot is open Monday through Saturday from 9:00 a.m. to 5:00 p.m.

Nancy Paquette, the South Brunswick Township recycling coordinator, developed a compelling cost comparison between the township's residential solid waste collection/disposal and residential curbside collection recycling programs (both of which are collected on a weekly basis by the same company) in which she **determined that recycling is 60% more cost effective than solid waste disposal** on a cost per ton basis and a cost per pound basis. Ms. Paquette's calculations are as follows:

Estimated 2012 cost for solid waste and recycling service per unit

Solid Waste:

Base collection cost: \$1,359,407

Disposal:

15,773 tons (2011 waste)

15,773 tons X \$62.50 = \$985,813

Total annual cost per unit =

$\$1,359,407 + \$985,813 = \$2,345,220 / 16,115 \text{ units} = \$145.53/\text{unit}/\text{year}$ or \$12.13/month

Cost per ton:

$\$2,345,220 / 15,773 \text{ tons} = \$148.69/\text{ton}$

Cost/pound:

$\$148.69 / 2000 = \0.074

Recycling:

Base Collection Cost (Single Stream): \$381,948

Revenue (2012 with 4 months averaged): \$112,550 (4,595 tons)

Total Annual Cost per unit:

$\$381,948 - \$112,550 = \$269,398 / 16,115 \text{ units} = \$16.72/\text{unit}/\text{year}$ or \$1.39/unit/month

Cost per ton:

$\$269,398 / 4,595 = \$58.63/\text{ton}$

Cost per pound:

$\$58.63 / 2000 = \0.029

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