3M COMPANY

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COMPANY BACKGROUND

The 3M Company is a global entity with more than 84,000 employees and annual revenue of $29.6 billion. The 196 acres of the Knoxville facility were originally purchased in 1969, construction of the initial plant started in 1973, and 3M Knoxville opened in 1975. The company produces pressure sensitive tape for industrial, automotive and construction applications. The Knoxville plant currently employs approximately 550 people and operates 24 hours per day, 362 days per year.

PROJECT BACKGROUND

3M Knoxville manufactures a large variety of products coated with adhesive. During the production of these products, scrap is generated from refused rolls as well as from excess material that has been cut off for quality reasons. While the majority of the scrap from the plant is recycled, 3M's goal is to minimize the remaining waste landfilled. The intern identified waste reduction and recycling options for the waste.

INCENTIVES TO CHANGE

The goal of the waste management project at 3M Knoxville is to maximize waste reduction and recycling efforts and reduce disposal costs. Objectives include reducing the amount of waste that is generated, increasing recycling of current material, identifying additional materials that are recyclable, finding markets for these materials, and minimizing the time and manpower required to dispose of waste sustainably.

RESULTS

Solvent Recycling: Solvent is used to clean adhesive from dies in the plant's coating bay. The disposal fees for this material are fairly high, at $3.27 per gallon or $180 per drum, so a more cost effective alternative could lead to substantial savings. The intern identified a vendor that could purify the used solvent and sell the products under its name. This will keep up to 13,750 gallons of solvent in the market each year.

Sandblast Stencil Incineration: Sandblast stencils are used when making intricate designs. One can cut the stencil to any desired shape, which makes this product attractive for companies with varieties of applications. Because the stencils are primarily made of rubber with a plastic backing, limited recycling opportunities exist for this product. The intern determined that waste-to-energy incineration was another alternative to sending this waste to the landfill. It is recommended that this material be shipped to a cement manufacturer that can burn it in place of coal. By switching to this option, 3M would not only prevent the landfilling of material; it would also displace roughly 245 tons of coal annually.

Increased Plastic Recycling: Plastic waste comprises a large portion of 3M Knoxville's waste stream. Because the company produces several kinds of tape, much of this waste material is coated with adhesive, which makes recycling difficult. However, there are a number of options for recycling plastic waste that is not coated with adhesive. Two options were identified by the intern: a company in northern Wisconsin that pelletizes and resells scrap plastic and a recycling business in Iowa City. Both are viable and environmentally positive choices.

Increased Paper Recycling: Much of the tape that comes out of the 3M Knoxville plant has paper associated with it, in addition to plastic. The paper may be coated with adhesive or silicon. Any paper with adhesive must be incinerated or sent to the landfill, but most paper, including that coated with silicon, can be recycled in one form or another.

Cardboard Core Recycling: Cardboard cores are used in many of the processes in the facility and a significant number of cores are landfilled each year. Since the cores are not made of the same material as corrugated cardboard boxes, they cannot be recycled in the same stream and must be collected and shipped separately. However, the intern determined that this is feasible and if there is room to collect them, the cores can be shipped to a recycling facility in Iowa City, along with the cardboard bales.

CONVENTIONAL AIR POLLUTANTS AND GREENHOUSE GASES DIVERTED IN STANDARD TONS

Total for all sectors					
CO_2	SO_2	CH_4	N_20	CFC	PM_{10}
608.30	0.12	305.30	0.89	0.81	0.62

PROJECT	ANNUAL COST SAVINGS	ENVIRONMENTAL RESULTS	STATUS
SOLVENT RECYCLING	$45,000	13,750 GALLONS	IN PROGRESS
SANDBLAST STENCIL INCINERATION	$6,000	226 TONS 51,850 THERMS	RECOMMENDED
INCREASED PLASTIC RECYCLING	$13,500	192 TONS	IN PROGRESS
INCREASED PAPER RECYCLING	$20,600	50.7 TONS	IMPLEMENTED
CARDBOARD CORE RECYCLING	$2,500	22 TONS	IMPLEMENTED