

Waste: What is it Really Costing You?

What is waste costing your company? The usual answers include:

It costs our company \$200 to dispose of a 55-gallon drum of hazardous waste.

Our solid waste disposal cost is just \$60 a ton.

Our wastewater disposal costs are only \$0.10 per gallon. Or,

The solvent in our parts cleaner is replaced every month for \$50.

Most companies can calculate their annual waste treatment and disposal costs easily. However, these costs are just the tip of the waste cost iceberg. Disposal costs are typically only about 15 percent of a waste's total costs (Rooney and Reid, 1996). And, just as an iceberg sunk the Titanic, the hidden waste costs could be sinking your company's profit margins.

Painting Case Study

An Ohio automotive manufacturing company illustrates how much hidden waste costs can add up. Looking only at the company's painting operation revealed significant waste costs besides just disposal costs. Each part receives a base coat of

paint. The company uses conventional paint spray guns with a transfer efficiency of 40 percent (meaning 60 percent of the base coat is lost). Transfer efficiency is the percentage of sprayed paint that actually ends up on the part. The company uses 700,000 gallons of base coat a year at a cost of \$30 per gallon. The value of the lost base coat alone is more than \$12.5 million. An improvement in transfer efficiency of only 10 percent would yield a cost savings of \$2 million in just raw materials savings! Other cost savings would include reduced wastewater treatment costs, reduced sludge generation and disposal costs, reduced paint booth clean-up costs, and reduced volatile organic compound (VOC) emissions.

The analysis also examined the company's re-painting of parts due to inferior paint quality. In paint raw material costs alone, the company spent more than \$2.5 million per year to re-paint parts. Obviously, reducing the number of parts to be re-painted will reduce raw material costs directly. Other savings would include labor, masking and sanding materials, purge solvents, wastewater treatment, sludge generation and disposal, and paint booth cleanup.



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Why should you want to know your company's total waste costs?

The same reason you should know any other business cost: to manage and reduce the costs. Only when the total cost of waste is known will it be managed accordingly. (What gets measured, gets managed.)



Unfortunately, too many companies only consider their disposal costs as their total waste costs. By focusing all their resources and basing their business decisions on reducing disposal costs, companies are ignoring larger waste cost drivers, missing significant cost saving opportunities, and possibly maintaining burdensome regulatory requirements.

How can you determine your company's total waste costs?

Understanding your company's processes is the crucial first step in determining your total waste costs. An effective technique to ensure this understanding is process mapping. Process mapping is an analytical and communication tool designed to help employee teams improve processes by enhancing the efficient use of resources and eliminating losses (wastes). This understanding includes identifying the raw materials, labor and losses (wastes) of the different process steps with their associated amounts (weight, volume) and costs. For more information on how you can use process mapping, see the "Where Can I Get More Help" section.



More and more companies are realizing that the best way to improve, simplify, or eliminate losses (waste costs) from their processes is through cross functional employee teams. Production, accounting,

environmental and maintenance departments are typically part of these cross functional teams. A company's total waste costs can consist of many different costs depending on the waste. These costs can typically be grouped into raw material, labor and waste management costs. Raw materials and labor are the most overlooked waste costs.

Raw material - Raw material costs are simply the cost of the raw materials in the waste. Every time a raw material is used and does not become a product, it becomes a waste. Utility costs, such as water and energy, are often overlooked.

Labor - Labor costs are especially applicable for rework and rejects.

Waste management - The most obvious expenses are treatment and disposal costs. Other waste management costs may include the expenses to collect samples, paper work, permit fees, consulting fees, etc.

Let's look at three examples.

Metalworking Fluids - Oil Mist Waste

The loss of metalworking fluids, as oil mist from eight lathe machines, was creating both a safety and a waste management issue for an Ohio manufacturer of machined parts. Oil filters were installed on the lathe machines to help capture and reduce the oil mist. Unfortunately, even with the oil filters, the oil mist still collected on equipment and the floor. Absorbent materials were used to collect the oil on the equipment and floor. Additionally, the shop floors were frequently mopped to remove the oil.

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What is the oil mist waste costing the manufacturer per year? The raw materials costs, including the oil mist (metalworking fluid), filters and absorbent materials are \$25,570. Labor costs, including those related to mopping the floor, changing the filters, managing the absorbent materials, are \$11,020. Disposal costs, including the spent filters and spent absorbent materials, are \$8,000. In this case study, they did not consider the cost of mop water disposal.

What's the annual cost of the oil mist? Not the disposal cost of \$8,000, but **\$44,590!**

Wastewater

An Ohio manufacturer of rubber automotive parts uses water in its manufacturing process. The company purchases city water and treats its wastewater (32,000 gallons per day) prior to discharging to the city's wastewater treatment plant. The treatment system consists of neutralization, metal precipitation, and sludge filtering.

What is wastewater costing the manufacturer per year? The raw material (water) cost is \$196,000 (this includes sewer fees). Treatment and disposal costs (including chemicals, labor and energy) are \$67,000. Sludge disposal cost is \$10,000.

What's the annual cost of the wastewater? Not the water costs of \$196,000, but **\$273,000!**

Rubber Waste

The same rubber parts manufacturer creates scrap rubber waste, 1,400 tons per year. Most of the rubber waste comes from their injection molding machines as edge/trim scrap. Many different types of rubber are used to manufacturer products. The manufacturer has tried to find a market to recycle their scrap rubber, but the various types of rubber wastes are co-mingled, making recycling difficult.

Therefore, the rubber waste is disposed in a solid waste landfill.

What is the waste rubber costing the manufacturer per year? The disposal cost is \$80,000, but the production costs (including raw materials costs) of the rubber are \$450,000.

What's the annual cost of the rubber waste? Not the disposal cost of \$80,000, but **\$530,000!**

These examples clearly illustrate that raw material and labor costs are larger than waste management costs. These examples also show the importance of identifying all the costs that contribute to the total waste costs.

It is not necessary to quantify all the costs down to the nearest penny. The goal is to identify the main waste costs to improve your company's management decision making. A company simply needs to determine the raw material costs, labor costs and waste management costs. Once these are understood, possible cost reduction efforts can be identified.

How can you save money by using the total cost of waste information?

Once you have an accurate understanding of your total waste costs, you can decide if they are high enough to justify efforts to reduce them.



Like most other costs, those who create the waste should be accountable for its costs. Once key losses (costs) are identified, you can analyze the factors contributing to the losses. Then solutions to eliminate the losses can be developed. Those who are responsible for the process can make changes that will lead to less waste and reduced costs.

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Where can I get more help?

U.S. Environmental Protection Agency's Environmental Accounting Project

The project goal is to encourage and motivate businesses to understand the full spectrum of their environmental costs and integrate these costs into decision making.



Contact: Kris Pierre
(202) 260-3068
www.epa.gov/opptintr/acctg/

Ohio Environmental Protection Agency Office of Pollution Prevention

The Office of Pollution Prevention provides free and non-regulatory assistance to companies on cost-effective measures to reduce the amount of waste they generate.

Contact: Kirk Nofzinger
(614) 644-3469
www.epa.state.oh.us/opp

Understanding a Process with Process Mapping. Robert B. Pojasek. *Pollution Prevention Review*. Summer 1997. 7(3): 91-101. (www.PollutionPrevention.com/Pdf-p2/understanding-a-process-with-process-mapping.pdf) This article and others on process mapping and waste costs are available on Dr. Pojasek's Web site (www.PollutionPrevention.com).

Financial Analysis of Pollution Prevention Projects. Ohio EPA Pollution Prevention Fact Sheet 33. October 1995. (www.epa.state.oh.us/opp/planning/fact33.html)

P2/FINANCE Version 3.0, Pollution Prevention Financial Analysis Cost Evaluation Spreadsheet Software Application

This is a spreadsheet system for conducting financial evaluations of current and potential investments. P2/FINANCE differs from conventional capital budgeting tools because it expressly addresses traditional obstacles to the financial justification of pollution prevention (P2) investments. Specifically, it expands the cost and savings inventory to include indirect and less tangible environmental costs. It also uses profitability indicators and time horizons that capture the longer-term savings typical of pollution prevention investments.

Available from:
Pollution Prevention Information Clearinghouse
(202) 260-1023
or downloadable at:
www.epa.gov/opptintr/acctg/download/p2finan.htm

Reference

Rooney C. and K. Reid. 1996. *Minimize Waste, Maximize Profit*. *Pollution Prevention Review* 6(2):85-92.

www.epa.state.oh.us/opp

The Office of Pollution Prevention was created to encourage multi-media pollution prevention activities in Ohio to reduce risk to public health, safety, welfare and the environment. Pollution prevention stresses source reduction and, as a second choice, environmentally sound recycling while avoiding cross media transfers. The Office develops information related to pollution prevention, increases awareness of pollution prevention opportunities, and can offer technical assistance to business, government, and the public.



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