

## GUILFORD OF MAINE

### *Cutting CO<sub>2</sub> out of the Fabric of a Business*

#### PROJECT SNAPSHOT

##### PROJECT

Development of "EcoMetrics" System

##### TECHNOLOGY

Use of PET instead of virgin fiber and computerization of manufacturing processes - among others

##### CO<sub>2</sub> EMISSION REDUCTIONS

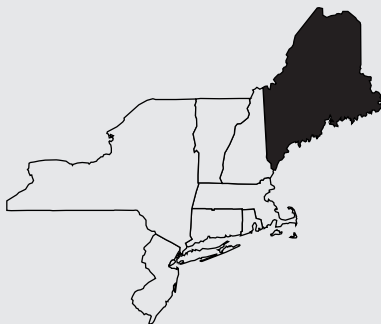
1,157 pounds CO<sub>2</sub> per yard of fabric produced from 1996-2000 or approximately 9,800 tons annually

##### INVESTMENT AND SAVINGS

\$625,000 investment; savings of more than \$3 million over 5 years

##### LESSONS LEARNED

- Although calculating emission reductions based on linear yards of fabric produced is not perfect, it provides an adequate measure of environmental performance over time.
- As data collection techniques improve, results tend to disclose less progress toward goal than estimates initially project.
- Emphasis on obtaining better data for the EcoMetrics program helped company identify numerous new ways to reduce materials and energy use, and save money.



#### INTRODUCTION

If you are sitting inside a cubicle in a typical office right now, you probably are not aware that you are smack in the middle of a small but significant global warming hot spot. Construction of a standard office cubicle or workstation demands about twenty yards of fabric – and delivers a host of environmental impacts. On the input side, those include 2.2 pounds of dyes and other chemicals, 1.5 pounds of packaging, 248 gallons of water and 500,000 British thermal units (Btus) of energy, or the equivalent of 3.5 gallons of oil. Outputs include some 1.7 pounds of solid waste destined for incinerators or landfills, and about 50 pounds of carbon dioxide. Those numbers may seem small, but when you're Guilford of Maine, a textile manufacturer that produces 17 million yards of fabric a year, they quickly add up. Historically heavily reliant on raw materials derived from petrochemicals, Guilford has set out to get those numbers down – and accurately track the results with its new EcoMetrics System. The results so far, which include cutting carbon emissions nearly in half, have been impressive. Among other things, Guilford has found a way to convert the empty soda bottles that workers in a medium-sized office would accumulate in a few days into the essential parts of a new office workstation.

#### PROJECT DESCRIPTION

In 1996, Guilford of Maine recognized that some of its manufacturing processes were hindering its desire to win recognition as a sustainable company. So it set out to fix them. The Guilford program included phasing out usage of virgin raw materials like polyester stock, and switching to recycled polyethylene terephthalate (PET) plastic – the stuff used to make soda bottles. This, plus cuts in water and energy consumption, led to significant reductions in solid waste generation and CO<sub>2</sub> emissions.

Throughout Guilford's supply chain, the conversion from virgin polyester stock to PET saves the equivalent of

4,000 barrels of oil for every million pounds of fiber used. Most of these savings are due to the simple fact that a lot less energy is needed to turn a used PET bottle into useful fiber. In fact, it takes only about 240 of these recycled bottles to produce twenty yards of fabric – enough for a typical office workstation. To close the loop even further, Guilford also recycles used fabric into new fabric.

In addition to capturing the cost savings and environmental benefits of recycling, Guilford computerized several of its production processes. This allowed the company to reduce water consumption at several stages of the process. The company also computerized combustion in its wood-fired boilers, nearly eliminating carbon monoxide emissions and significantly reducing CO<sub>2</sub> as well. Next, Guilford decentralized its lighting system; now more areas can operate independently, and thus more lights can be turned off when not needed. Finally, the company set out to develop an EcoMetrics system to track and measure environmental progress, compiling data on a quarterly basis. Carbon emissions are based on the linear yards of fabric produced. This ratio provides an adequate measure of the company's performance over time.

#### THE RESULTS

Employing the EcoMetrics system has allowed Guilford of Maine to cut its use of many non-renewable resources, and to make strides toward the goal of becoming a "sustainable and restorative" company. For example, Guilford has increased the recycled content of its raw material from 0.8 percent in 1996 to 69.8 percent in 2000. During the same period, the company decreased water usage per linear yard of finished fabric from 14.2 gallons to 9.37 gallons, while reducing energy usage per linear yard from 30,101 Btu to 20,717 Btu. In fact, by 2000, 32.4 percent of all energy used at the plant was derived from waste wood chips from a woodworking factory less than a half-mile away. In addition, solid waste generation per linear yard of fabric declined

from 0.078 pounds in 1996 to 0.025 pounds in 2000, and CO<sub>2</sub> emissions per linear yard from 3.527 pounds to 2.37 pounds – approximately 9,800 tons for the five-year period. This is equivalent to avoiding the use of 49 barrels of oil a day or removing 1,378 typical passenger cars from the road annually. Equally good news, Guilford has saved more than 22 percent – or \$3 million – on its energy and water bills.

### LESSONS LEARNED

A major challenge, notes Paul Paydos, Guilford's Vice President of Technical Services, has been to identify appropriate normalization factors – that is, the proper ratio between linear yards of fabric produced and the associated carbon dioxide emissions and other waste products. Because production of any single line changes from year to year, the normalization factor will not precisely track environmental impact. Nonetheless, the company has found that individual ratios that are not perfect at a given moment do provide an adequate measure of performance over time. A somewhat ironic counterpoint to the preceding is that the company also has discovered that more refined measurement techniques sometimes undercut more general projections. "The better you get at collecting the data, the farther away you get from your goal," Paydos succinctly observes. However, the reason is not that gross estimates are wrong, but that they incorporate savings not subject to more precise, measured assessment. "Although the firm's indicators are headed in the right direction, if the base year data reflected all of the impacts Guilford currently measures, the metrics would show even greater progress," he points out. Nonetheless, Guilford's engineers believe that the company's focus on gath-

ering more accurate data for its EcoMetrics program has helped identify a number of additional ways to reduce material and energy use – and save money.

### FUTURE COMMITMENTS

As one of 228 charter members of EPA's National Environmental Achievement Track Program, Guilford of Maine has made a three-year commitment, starting in 2000, to:

- Reduce water use by 12%.
- Reduce energy use by 11%.
- Reduce solid waste generation by 25%.
- Increase the use of recycled raw materials by 20%.

As part of this pledge, Guilford must complete a short Annual Performance Report to demonstrate to EPA and the public that progress is continuing and the facility is maintaining its commitment to strong environmental performance.

### COMPANY PROFILE

Guilford of Maine is a division of Interface Fabrics Group Incorporated, a global textile manufacturer based in Atlanta. Interface, which topped \$1.2 billion in sales in 1999, is the world's largest manufacturer, marketer, installer and servicer of products for commercial and institutional interiors, including carpet and carpet tile; interior fabrics; and the chemicals, adhesives and architectural flooring products that work together to create the modern office environment. In April 1999, Interface and two other firms became the first in the nation to receive Climate

Neutral Certification from the Climate Neutral Network, a nonprofit alliance of companies and other organizations committed to developing products and enterprises that eliminate their impacts on the earth's climate.

The facility in Guilford, Maine manufactures high-quality fabrics for commercial interiors, including panel fabrics, wall coverings and upholstery products for office furniture. Guilford was founded in 1865 and currently has 600 employees in five locations, including two in Maine and one in Canada. Guilford's main product line is Terratex® – a fabric made from 100% post-consumer or post-industrial waste such as plastic soda bottles, film and packaging materials. The company is ISO 14001 certified.

### CONTACTS

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#### EPA's National Environmental Performance Track Program Web Site

[www.epa.gov/performance-track/](http://www.epa.gov/performance-track/)

#### Climate Neutral Network Web Site

[www.climate-neutral.com/](http://www.climate-neutral.com/)

### CLEAN AIR-COOL PLANET CASE STUDY RATING

*This case study reduces CO<sub>2</sub> emissions equivalent to the following:*

Avoiding the consumption of 49 barrels of oil per day. (1 barrel = 3 barrels of oil)



OR Taking 1,378 vehicles off the road per year. (1 car = 100 vehicles)



Assumptions: 1,093 lbs of CO<sub>2</sub> per barrel of oil. Vehicles are average passenger cars (approximately 20 lbs CO<sub>2</sub> per gallon of gasoline - 22.5 miles per gallon, averaging 16,000 miles per year)