

Introduction

Our goals for the Challenge were to decrease carbon emissions and raise environmental awareness. To achieve this, we chose a two-pronged strategy that capitalized on partnerships with both private industry and the Georgia Tech Department of Housing:

1. Recycling industrial materials at RBC Bearings, Inc.
2. Clothing drive with Georgia Tech residence halls



Rebecca Harris, Olivia Myers, Priscilla Tong, Mary Catherine Farrell

Strategy 1: Industrial Materials Recycling

Partnered with Hartsville, SC RBC Bearings, Inc. factory to implement materials recycling programs for the following: **salvageable wooden pallets, unsalvageable wooden pallets, plastic drums, and cardboard**. There previously existed no such recycling programs, with all waste collected in the same trash dumpster and sent to landfill. Detailed cost and carbon emissions reductions illustrated below, with total annual cost savings for the company predicted to equal an estimated **\$15 240**. This strategy practically addresses the common issue of sustainable waste management concerns which plague older manufacturing facilities throughout the Southeast. (Pictured at left: standard industrial wooden pallets.)

Plastic Drums

◆ **Implementation:** Taken with unsalvageable wooden pallets to local recycling facility where shredded into granules before washing and drying for re-use. Primary consumer currently a plastic pipe manufacturer.

◆ **Cost:** Revenue Neutral

Unsalvageable Wooden Pallets

◆ **Implementation:** Piled onto dropped trailer along with plastic drums and shipped to local recycling facility where ground into rough chips and used to fuel, particle board stock, or mulch.

◆ **Cost:** Revenue Neutral

Salvageable Wooden Pallets

◆ **Implementation:** Stacked on back half of the company truck on its bi-monthly trips to a primary vendor (Armaloy, a chrome-plating facility) located in the same town. There, slats and nails are replaced as necessary and the pallets sold to other companies for reuse.

◆ **Cost:** Revenue Neutral

Strategy 1 Total CO₂ Reductions: **189,868.55 lbs CO₂**

Unsalvageable Wooden Pallets

| | | | |
|---------------|---|----------------------------|-----------------------------------|
| 20.41 tons | x | 1.95 ton CO ₂ e | = 39.7995 metric tons/month |
| month (March) | | ton recycled | avoided CO ₂ emissions |
| 17 tons | x | 1.95 ton CO ₂ e | = 33.1689 metric tons/month |
| month (April) | | ton recycled | avoided CO ₂ emissions |

=72.9684 tons = 106,867.79 lbs

-219.9 lbs CO₂ x 4 trips = 879.6 CO₂ transportation emissions for 4 weeks

= **159,988.19 pounds CO₂e**

Salvageable Wooden Pallets

| | | | |
|---------------|---|---|-----------------------------------|
| .68 tons | x | 1.95 ton CO ₂ e ³ | = 1.326 metric tons/month |
| month (March) | | ton recycled | avoided CO ₂ emissions |
| .27 tons | x | 1.95 ton CO ₂ e | = 0.5265 metric tons/month |
| month (April) | | ton recycled | avoided CO ₂ emissions |

=1.8525 tons CO₂e = **4084.06 pounds CO₂e**

The annual CO₂ emissions equivalents of 1 average American household

Strategy 2: Clothing Drive

- ◆ **Implementation:** Collected 236.5 pounds of clothes from donation centers set up in 20 GT residence halls and an open mic night event (1 article of clothing for Admission). This clothing was then donated to Goodwill.
- ◆ **Additionality:** Preventing people from buying a new article of clothing, thus preventing emissions from its manufacturing process (production and transport, not life cycle). Clothes that Goodwill cannot resell will be sent to textile recyclers (salvage stream) to further address emissions from textile waste in landfills.
- ◆ **Scalability:** Participation rate of 482 pieces of clothing donated. Potential audience of entire enrolled student population of 21,500.
- ◆ Total CO₂e averted: 4455.396 lbs CO₂^{1,2}



194,323.95 lbs CO₂

References:

¹ Bureau of International Recycling (n.d.) Recycling Facts. Retrieved from <http://www.bir.org/industry/textiles>

² Ecofx (2011). Environmental Impact of Trousers and Pants. Retrieved from http://ecofx.org/wiki/index.php?title=Trousers_%26_Pants

³ Environmental Protection Agency, Climate change and waste. (2012). Waste reduction model. Retrieved from website: http://www.epa.gov/climatechange/waste/calculators/Warm_home.html