

# Carbon Neutral Operations

During 2007, with a goal of operational environmental sustainability, the John Roberts Company conducted an independent scientific study to determine the carbon footprint of its business activities. Specifics of this study are viewable in this article.

A carbon footprint is a measure of carbon contributions to the environment resulting from operational activities. Carbon contribution, in the form of greenhouse gases, specifically carbon dioxide, traps heat in our atmosphere and is thought to be a significant contributor to recent global warming. An increase in global climatic temperature is of environmental and economic concern.

Reduction in the size of a company's carbon footprint are ideally accomplished through best manufacturing processes, and may be supplemented with carbon offsets purchased on the open market. The goal here is to approach or achieve carbon neutrality.

To be carbon neutral, there can be no atmospheric net gain in carbon emissions due to the company's business activities.

Through its extensive, long-term efforts to recycle materials that would otherwise have ended up in a landfill, John Roberts' is pleased to announce that its operations have achieved carbon neutrality!

The John Roberts Company and all of its employees are proud of the accomplishments in sustaining responsible environmental stewardship.

## Technical Specifics of Study

The scope of this study was defined and limited to John Roberts' activity of manufacture and distribution of commercial printed products. Of practical necessity, the study did not consider upstream carbon contributions resulting from the manufacturing and distribution activities of its materials suppliers. Our reasoning is that secondary carbon contributions to the John Roberts' product seem best addressed by the suppliers as they develop their own carbon footprints. This approach is not unlike the European Union's Value Added Tax (VAT), with each contributor assessed their own contribution to the final product.

The study measured the energy inputs to its operations over a 12-month period. Energy inputs included electrical energy (kilowatt/hours), natural gas (therms), and fuels used in distribution (gallons). Adjustments to these data were made to account for offsetting factors. For example, as a part of EPA's Green Power program, the company purchases 10% of its electrical energy right on its own power grid, making a difference right here in Minnesota, not some distant location.

Parallel computations were made on multiple carbon emissions calculators<sup>1</sup> to arrive at the company's carbon footprint. Among the calculators used:

The United Kingdom's National Energy Foundation CO2 Calculator determined that John Roberts' business activities emitted 3,723,076 kgCO2 or 4,103 Tons (US) of CO2. That amount of CO2 has a carbon equivalent of 1,016,399.7 kg or 1,120 Tons (US) of carbon emitted.

A second calculator, the Pure Clean Planet Trust Calculator came up with essentially similar results, 4,082 Tons (US) of CO2.

Entering the larger of the two results above, 4,103 Tons (US) into the U.S. Climate Technology Cooperation Gateway's Greenhouse Gas Equivalencies Calculator provided a number of interesting equivalencies if John Roberts wanted to balance their CO2 emissions. Perhaps the most interesting carbon equivalent offset relative to John Roberts' business activities would be to balance the company's carbon emissions with recycling of materials that would otherwise end up in a landfill.

According to the calculator above, recycling 1,253 tons of waste would balance the company's carbon emissions of 1,120 Tons (US) of carbon (C). For those interested, the formula for this equivalency calculation is:

$$0.81 \text{ MTCE/ton} * 44 \text{ g CO}_2/12 \text{ g C} = 2.97 \text{ metric tons CO}_2\text{E/ton of waste recycled}$$

In the 12-month period ending November 30, 2007, the company recycled 5,460 Tons of materials that would otherwise be landfilled. This amount significantly surpasses the 1,253 Tons required by the calculation above to achieve carbon neutrality in 2007.

## Equivalency Formula

$$0.81 \text{ MTCE/ton} * 44 \text{ g CO}_2/12 \text{ g C} = 2.97 \text{ metric tons CO}_2\text{E/ton of waste recycled}$$

### Formula Specifics

To develop the conversion factor for recycling rather than landfilling waste emission factors from EPA's WASTE Reduction Model (WARM) were used (EPA 2003). These emission factors were developed following a life-cycle assessment methodology using estimation techniques developed for national inventories of greenhouse gas (GHG) emissions. According to WARM, the net emission reduction from recycling mixed recyclables (e.g., paper, metals, plastics), compared to a baseline in which the materials are landfilled, is 0.81 MTCE per short ton. This factor was then converted to metric tons of carbon dioxide equivalent (MTCO2E) by multiplying by 44/12, the molecular weight ratio of carbon dioxide to carbon.

Source: EPA (2003). WASTE Reduction Model (WARM). U.S. Environmental Protection Agency.  
<http://yosemite.epa.gov/oar/globalwarming.nsf/WARM?OpenForm>

# 2007 Recycled Materials

In the 12-month period ending November 30, 2007, the company recycled 5,460 Tons of materials that would otherwise be landfilled. This amount significantly surpasses the 1,253 Tons required by the calculation above to achieve carbon neutrality.

The specific materials recycled consist of:

**Generated: 286.00 tons to disposal as trash**

**Recycled: 5431.44 tons of trim paper**

**23.38 tons of spent cleaning solvents**

**1.21 tons of used lubricating oils**

**0.28 tons of unusable wipers**

**1.41 tons of imaging film**

**2.28 tons of electronics**

**5460.00 tons total recycled**

The totals for recycled materials for the most recent previous years are:

**2006: 4337.00 tons total recycled**

**2005: 5294.00 tons total recycled**

Note: All data for each reporting year has been filed with Anoka County, Minnesota, and is a matter of public record with the county. Recycling and disposal data has been filed with the county since the mid-1990s.