



# REDUCING GREENHOUSE GAS EMISSIONS: MUNICIPAL SOLUTIONS

## FACT SHEET #3: RECYCLING AND COMPOSTING



### What is Climate Change?

Our global climate is always changing, but now the rate of change is accelerating much faster than ever before. The Earth's average temperature has increased by 1°F over the past 100 years. Although the change seems small, it has happened very quickly—a mere speck on the Earth's long lifetime. Rapid climate change can have major impacts on many aspects of the environment, such as water quality, agriculture, coastal erosion, and sea level.

Temperature changes naturally as a result of the Earth's CO<sub>2</sub> (carbon dioxide) cycle. Animals and other living things release CO<sub>2</sub> into the air, while other organisms, such as plankton, absorb CO<sub>2</sub> through the ocean. For millions of years, carbon dioxide and the other greenhouse gases (such as methane) were balanced by the Earth's delicate atmosphere. Since the Industrial Age, human activities, such as fossil fuel burning and de-forestation, have disturbed this balance. CO<sub>2</sub> emissions are now so high that they cannot be completely absorbed naturally. As a result, CO<sub>2</sub> is building up in the atmosphere and the Earth is warming (see figure below).

### What We Can Do: Recycling and Composting

There are many ways to deal with the challenge of climate change. Some programs work to reduce carbon emissions, while others help communities adapt to environmental changes. The Waquoit Bay National Estuarine Research Reserve has identified several priority measures that communities can implement in order to lower the amount of carbon emissions they produce. This fact sheet focuses on recycling and composting.

#### Why Recycle?

Recycling saves space and energy. By keeping waste out of landfills, communities have more space for living, working, and recreation. Recycling recovers valuable raw materials. For example, if aluminum cans are made from recycled cans, the environment will not be disturbed by mining. Recycling reduces pollution and saves energy that would have been used to make products from new, un-recycled raw materials.

Recycling is most effective when there is a market for the materials, that is when consumers buy recycled products. While nearly anything can be recycled, typical products include aluminum cans, glass, paper, and plastic. Typical products made from recycled materials include paper, cardboard, and building materials.

The EPA believes that cutting the amount of waste we generate back to 1990 levels could reduce greenhouse gas emissions by 11.6 million metric tons. Increasing our national recycling rate from the current 28% to 35% would reduce an additional 9.8 million metric tons of emissions. Together, these two efforts would cut more than 21.4 million metric tons of greenhouse gases—an amount equal to the annual emissions of 11 million households in America.



Source: EPA

Evidence of climate change is all around us. Severe weather is becoming more common. Not only is the Earth's temperature rising, but the world's oceans are also rising. Signs of high sea levels and beach erosion become more obvious every year. These environmental impacts will become more serious as CO<sub>2</sub> continues to build up.

**Case Study: Integrated Waste Management, Nantucket, MA**

According to the EPA, landfills are the largest source of human-generated methane emissions in the United States. Methane is a carbon-compound that is the second most abundant greenhouse gas found in the atmosphere. Landfill waste can be broken down by bacteria, releasing methane or biogenic CO<sub>2</sub>. The amount of methane emissions depends on the waste composition, moisture, and the landfill size. The more solid waste in a landfill, the greater the potential for emissions.

Like many towns on Cape Cod, Nantucket has experienced a rise in population that increases the strain on infrastructure. By 1995, the Town of Nantucket was facing a serious crisis over its solid waste handling and the costs associated with it. Its landfill continued to grow, and it became thronged with seagulls, feeding from the hill of trash. In 1994, the state of Massachusetts ordered Nantucket to close its landfill and to ship its waste for disposal on the mainland. This act could have quadrupled trash bills for all islanders.

Faced with serious environmental and economic problems, the town selected Waste Options, Inc., a Rhode Island-based company, to implement a solid waste disposal program. The Nantucket Solid Waste Recycling and Composting Facility is the most comprehensive in the state, recycling nearly 90 percent of the island's waste materials by 1999.

**Nantucket Integrated Waste Management Facility**

Almost 90% of waste materials on Nantucket Island are recycled and/or diverted from landfills. Their waste management includes:

Materials Recovery	Processing of standard recyclables, including paper, plastics, glass, and metal Styrofoam packing distributed to local shippers for reuse
Construction & Demolition	wood to chipper metals to recycling concrete for reuse non-recyclables to landfill
Take It or Leave It	Swap shop
Tree and Brush Chipper	Reuse for landscaping
Leaf and Yard Waste	Compost for landscaping
Hard to Manage Waste	For wastes such as refrigerators, mattresses, etc. Shipped off-island to recycler
Tire Staging Facility	Rims to metals recycling; tires recycled
Metals Staging	Metal recycling

In conjunction with the recycling facility, the Town also built an enclosed in-vessel composting system, which converts organic wastes and municipal biosolids into valuable topsoil and sends no more than 20 percent of incoming materials to the landfill. This compost exceeds the quality for both federal and state standards and is used primarily for landscaping around the island.

**Sources:**

Waquoit Bay National Estuarine Research Reserve, "Global Climate Change: What Communities Can Expect and What They Can Do", Science and Policy Bulletin Number 7, July 2001.

Cape Cod Commission: - <http://www.capecodcommission.org/waste>

Commonwealth of Massachusetts - <http://www.state.ma.us/dep/recycle/cities.htm>

Environmental Protection Agency - <http://www.epa.gov/globalwarming>

Waste Options, Inc. - <http://www.wasteoptions.com/nantucket.htm>