

US EPA ARCHIVE DOCUMENT



Climate Change

CASE STUDIES



Preserving Resources,
Preventing Waste

General Motors—Reducing Its Environmental Footprint

Maintaining its position as the world's largest automotive manufacturer is no small task for WasteWise partner General Motors (GM). One way the company demonstrates its leadership is by decreasing its environmental footprint through waste reduction efforts. For years, GM has worked hard to improve its waste reduction efforts and continues to learn and implement new initiatives in waste prevention and recycling.



Every stage of a product's life cycle—extraction, manufacturing, distribution, use, and disposal—contributes to the concentration of GHGs in the Earth's atmosphere, and GM considers all of these phases when investigating ways to decrease its burden on the environment. The company's activities are based on two main goals: 1) to

reduce GHG emissions and 2) to prevent waste and increase recycling, which also tend to further GHG emissions reductions. Through WasteWise and another prominent EPA voluntary program—Climate Leaders—GM is decreasing its facilities' GHG emissions through waste reduction and other means.

As part of GM's efforts to prevent waste, increase recycling, and reduce GHG emissions, GM continuously tracks and analyzes its activities. GM calculates that it has decreased its generation of wastes targeted by the WasteWise program by 35 percent (including a 54 percent drop in non-recyclable material disposal) between 1998 to 2002. According to EPA's Waste Reduction Model, also known as WARM—a tool that allows

“GM strongly supports these types of voluntary initiatives. It is partnerships like WasteWise that allow us to produce considerable results in reducing greenhouse gas emissions while continuing our waste reduction efforts.”

—Elizabeth A. Lowery, GM Vice President,
Environment and Energy

clung. Through its participation in the U.S. Environmental Protection Agency's (EPA's) WasteWise program, GM continues to learn that every bit of waste reduced decreases greenhouse gas (GHG) emissions from its facilities.



Waste Reduction Strategies

GM's waste prevention, recycling, and use of recycled-content materials in vehicles provide a solid base for its participation in WasteWise. Since 1994, GM has shared many of its successful results with other WasteWise partners. Below are just a few highlights.

Umbrella Waste Reduction Activities

GM has led the development of a strategic alternative to disposal contracting that seeks to continually improve resource efficiency through enhanced source reduction, recycling, and recovery—known as

Sample of GM's Waste Prevention Accomplishments

| Waste Prevention Activity | Waste Disposal Reduction (tons) | Savings |
|---|---------------------------------|-----------|
| Service and Parts Operations sold new, but obsolete, spare metal parts to an outside service provider for reuse rather than scrapping them. | 969 | \$205,000 |
| A metal fabricating plant reduced waste disposal through employee training and improved efficiencies in plant trash management. | 832 | \$35,900 |
| An assembly plant incorporated new sludge filters into three paint systems, reducing the amount of sludge landfilled. | 400 | \$150,000 |
| A metal fabricating facility reduced the use of floor block by switching to concrete flooring. | 381 | \$40,600 |

Resource Management (RM). By tying financial incentives to the value of services that foster prevention, reuse, and recycling, RM encourages alignment of contractors' activities with the customers' waste reduction goals in a new type of joint effort. GM's RM program conserves natural resources, reduces environmental impacts, and provides considerable cost savings. After just 4 years, GM's participating facilities have reduced waste disposal by 42 percent. The RM program is now in place at 94 percent of GM's North American facilities, with 100 percent global implementation targeted for the future. For more information on RM, visit www.epa.gov/wastewise/wrr/rm.htm.

GM is one of many WasteWise partners whose waste reduction directives do not come only from upper management. Another strategy GM implements at its 75 facilities in the United States is its "WE CARE" teams. These groups of salaried and union employees meet on a regular basis to discuss pollution prevention and energy conservation ideas. They work together to coordinate projects and activities across various depart-

ments throughout the company.

Waste Prevention

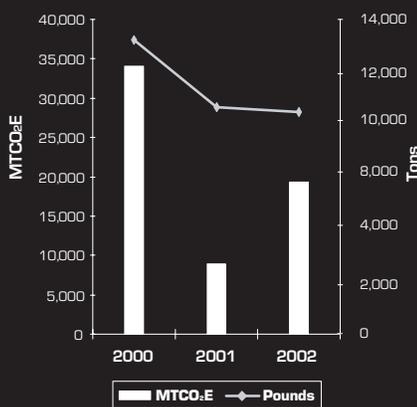
As part of its waste prevention mission, GM has been improving supply chain environmental management and Design for the Environment. As part of this commitment, GM was a founding member and instrumental in the formation of the Suppliers Partnership for the Environment (SP) with EPA. This new trade association provides a self-sustaining forum for auto manufacturers and suppliers within the automotive supply chain to develop and share tools, information, knowledge, good practices, and technical support, thereby ensuring that the suppliers' products and their processes provide environmental improvement and cost savings to SP participants.

Recycling Activities

When wastes cannot be prevented, GM recycles as many materials as possible. To effectively accomplish this goal, GM works with its waste management contractors. Through its RM contracts, GM's U.S. facilities increased their recycling rate

GM's waste prevention efforts decreased waste generation by more than 8,800 tons of solid waste in 2002. Since 2000, these efforts have reduced GHG emissions by more than 58,650 MTCO₂E.* 2002's reductions are equivalent to the annual carbon stored by more than 158 acres of established, rapidly growing trees or the annual emissions from power consumption of more than 2,500 households.

GM's Waste Prevention Accomplishments



* 3.67 MTCO₂E = 1 MTCE

MTCE = Metric Ton of Carbon Equivalent

MTCO₂E = Metric Ton of Carbon Dioxide Equivalent

by 8.7 percent between 2000 and 2002 and now recycle more than 2.3 million tons of materials annually. In 2002, GM saved almost \$180 million due to its recycling efforts.

Recycled Content of Vehicles

GM currently focuses on reducing environmental impacts of many automotive parts, including headliners, door trim, instrument panels, bumpers, seats, and exterior moldings. In North America alone, GM already uses the following amounts of recycled materials in its vehicles annually:

- 8,500 tons of nylon fibers from recycled carpet
- 5,400 tons of polypropylene from recycled soda bottle caps
- 650 tons of polyvinyl chloride from recycled wiring
- 3,400 tons of polyester from recycled soda bottles
- 2,900 tons of rubber from recycled tires
- 1,300 tons of thermoplastic olefin from recycled soda bottle caps

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Examples of GM's 2002 Recycling Successes

| Material Recycled | Quantity (tons) |
|----------------------------|-----------------|
| Asphalt and concrete | 198,485 |
| Corrugated cardboard | 22,355 |
| Rubber | 516 |
| Glass | 149 |
| HDPE | 3,832 |
| Textiles | 529 |
| Mixed plastics | 3,037 |
| Polypropylene | 293 |
| High-grade and mixed paper | 2,337 |
| Yard trimmings and wood | 27,442 |

Decreasing GHG Footprints—An Overview

GM works to reduce its GHG footprint from its worldwide facilities in many ways. Three main strategies in GM's concerted effort include:

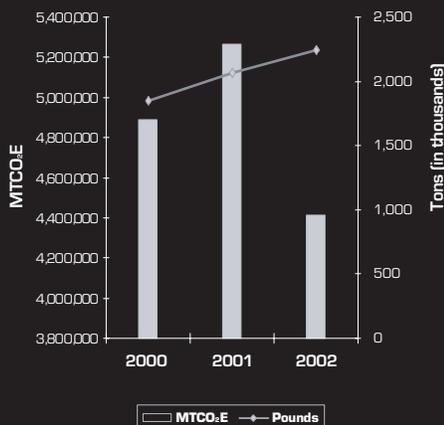
- **Resource conservation.** By conserving raw materials, GM helps sustain ecosystems for generations to come. For instance, the company continues to increase its use of recycled-content materials to replace the use of raw materials. By using recycled materials, GM decreases GHG emissions because the raw material has been previously processed. Conserving resources not only increases raw material availability for the future, but also increases demand for innovative ideas to produce the same product in a new, more efficient way.
- **Waste management.** GM understands that all products impact our environment, especially when disposed. GM works with its designers, manufacturers, suppliers, waste haulers, and others to encourage them to practice reuse, recycling, and the most environmentally preferable disposal or salvage methods.
- **Clean and renewable energy use.** GM works to reduce its dependence on natural resources for energy in its plants. By using cleaner forms of energy, GM helps reduce the amount of GHGs emitted into the atmosphere. At its U.S. facilities, GM implemented an Energy Efficiency Plan, which helps support the company's focus on new, cleaner,

more efficient technologies. GM launched the plan at all powertrain and assembly facilities in 2001 and to other facilities in 2002.

Through facility management systems, materials usage and waste prevention, new product attributes, employee and community education, and energy management, GM conserves the Earth's natural resources. Although GM focuses its GHG emissions reductions efforts across many initiatives, two of the above-mentioned activities—resource conservation and waste management—tie directly to the company's participation in WasteWise.

Since 2000, GM's recycling efforts have resulted in emissions reductions of more than 14 million MTCO₂E.* In 2002, GM avoided emissions of more than 4.4 million MTCO₂E—equal to the annual carbon dioxide stored by 36,190 acres of established, rapidly growing trees or the annual emissions from power consumption of more than 574,000 households.

GM's Recycling Accomplishments



* 3.67 MTCO₂E = 1 MTCE

MTCE = Metric Ton of Carbon Equivalent

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GM produced radiator side air baffles for the Hummer-H2 with 70 percent post-consumer recycled-content materials, using 12.5 tons of rubber from used tires. GM also creatively uses recycled fabric for floor

insulation in all of its newest SUVs. By using recycled-content materials, GM greatly reduces its GHG emissions. The company is currently working with EPA on developing GHG emission conversion factors for using recycled-content materials.

General Motors—Reducing Its Environmental Footprint

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organizations to calculate GHG emissions reductions related to waste prevention and recycling activities—the company's waste reduction efforts resulted in annual GHG emissions reductions of more than 4.4 million metric tons of carbon dioxide equivalent (MTCO₂E) between 2000 and 2002. With support from WasteWise, GM strives to reduce the total amount of waste generated at all of its worldwide facilities by an additional 15 percent and increase recycling rates by 15 percentage points by the end of 2005.

Leading the Way for Other WasteWise Partners

Waste prevention and recycling offer significant potential to reduce GHG emissions. EPA estimates that by increasing the national recycling rate from 30 percent to 35 percent, Americans could reduce GHG emissions by an additional 36.7 million MTCO₂E. This is equivalent to

the annual emissions from power consumption for more than 16 million homes.

GM is one of many WasteWise partners making the link between



waste reduction and GHG emissions reductions and wants to help others understand the importance that this connection plays in improving environmental efforts—whether in the office, on the production floor, or even in the community. If you want to learn more about the specific activities mentioned in this case

study, such as working with suppliers to purchase recycled products, increasing the amount of recycled materials in products, developing a Resource Management

Resources

GM's Web Site

<www.gmability.com>

WasteWise Web Site

<www.epa.gov/wastewise/climate>

Suppliers Partnership for the Environment Web Site

<www.supplierspartnership.org>

Climate Leaders

<www.epa.gov/climateleaders>

program, or implementing waste reduction project teams, please contact the WasteWise Helpline at 800 EPA-WISE (372-9473) for technical assistance to decrease your environmental footprint.