

**Demonstrating the Connection
Between Effective Energy & Waste
Management Practices and
Greenhouse Gas Emission
Reductions:**

A Climate Leaders Progress Report

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Environment and Energy Strategy

GM-Public Policy Center





GM's EPA Climate Leaders Commitment

A 10% Reduction in
Absolute CO2 Emissions from GM's North American Facility
Direct Fuels Usage and Indirect Electricity and
Steam Purchases from 2000-2005

GM's EPA Climate Leaders Progress: 2003

	<u>2000</u>	<u>2002</u>
GMNA Total Facilities CO ₂ 10.66 (million metric tons)		11.34
GMNA Total Facilities Energy (TBTU)	102.07	93.99
		<u>2000-2002</u>
GMNA Total Facilities CO ₂ Reduction		6.00 %
GMNA Total Facilities Energy Reduction		7.92 %

Strategies to Achieve our Commitment

General Motors Global Climate Key Messages

- The challenge is to meet the world's growing demands for energy necessary to sustain economic growth while also addressing long-term concerns about the environment.
- GM believes that technology and innovation in all sectors are the most effective ways of improving energy efficiency and reducing greenhouse gas emissions.
- GM is taking steps to achieve near-term reductions and develop new technologies.
- GM supports scientific research to improve understanding of the climate system.
- GM supports voluntary initiatives and market incentives, but opposes government mandates.

GM Supports Voluntary Initiatives ...

Environmental Protection Agency - Microsoft Internet Explorer

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Address <http://www.epa.gov/climateleaders/resources.html> Go Links

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CLIMATE LEADERS
U.S. Environmental Protection Agency

The Climate Leaders Umbrella

Climate Leaders is a new voluntary EPA industry-government partnership that encourages companies to develop long-term comprehensive climate change strategies. Partners set a corporate-wide greenhouse gas (GHG) reduction goal and inventory their emissions to measure progress. By reporting inventory data to EPA, partners create a lasting record of their accomplishments, identify themselves as corporate environmental leaders, and strategically position themselves as climate change policy continues to unfold.

- Energy Star
- Green Power Partnership
- Natural Gas Star
- Landfill Methane Outreach Program
- Waste Wise
- CHP Partnership
- Coalbed Methane Program
- Commuter Choice Leadership Initiative

<http://www.epa.gov/climateleaders/>

Internet





GM and Energy Star ...

Industry Challenges in Energy Management

Primary fuel volatility restricts business stability

- **As the World becomes a Global Market Place – equality in Energy Consumption will happen**
 - **India- cost/kwh \$0.14 labor \$0.84/hr ratio 6:1**
 - **U.S.- cost/kwh \$0.10 labor \$45.00/hr ratio 450:1**
 - **At the India energy expense ratio, this would equate to a \$7500 electric bill for a family that presently spends \$100/month CONSERVATION WOULD NOW BE A MORE SIGNIFICANT PRIORITY!!!!!!**

* SOURCE: BP Statistical Review of World Energy 6/2002



GM and Energy Star ...

Industry Challenges in Energy Management

Case for Action

The Manufacturing Industry has a Responsibility to reduce Energy Consumption from our Manufacturing Operations (Cost Savings, National Security, etc.)

Those of us in this room are the Leaders for making this happen



GM and Energy Star ...

***Industry Challenges in Energy
Management***

GM is Focused on Energy

- Auto Industry Competitiveness is driving structural cost reduction
- Energy saving dollars contribute to bottom line directly
- GM's Energy Budget is less than 1% of our sales
- Every \$1,000 saved is equal to \$20,000 in product sales for a profit margin goal of 5%.
- We are continuing to identify opportunities for future energy cost reductions



GM and Energy Star ...

Industry Challenges in Energy Management

■ Energy Savings Contributes to Environmental Stewardship

• Driven by GM's Sustainability Focus

General Motors' Environmental Principles

As a responsible corporate citizen, General Motors is dedicated to protecting human health, natural resources, and the global environment. This dedication reaches further than compliance with the law to encompass the integration of sound environmental practices into our business decisions.

The following environmental principles provide guidance to General Motors personnel worldwide in the conduct of their daily business practices.

1. We are committed to actions to **restore and preserve the environment**.
2. We are committed to **reducing waste and pollutants**, conserving resources, and recycling materials at every stage of the product life cycle.
3. We will continue to **participate actively in educating the public** regarding Environmental conservation.
4. We will continue to pursue vigorously the **development and implementation of technologies** for minimizing pollutant emissions.
5. We will continue to work with all governmental entities for the development of technically sound and financially responsible **environmental laws and regulations**.
6. We will continually **assess the impact of our plants and products** on the environment and the communities in which we live and operate with a goal of continuous improvement.



GM and Energy Star ...

Industry Challenges in Energy Management

GM's Energy Focus

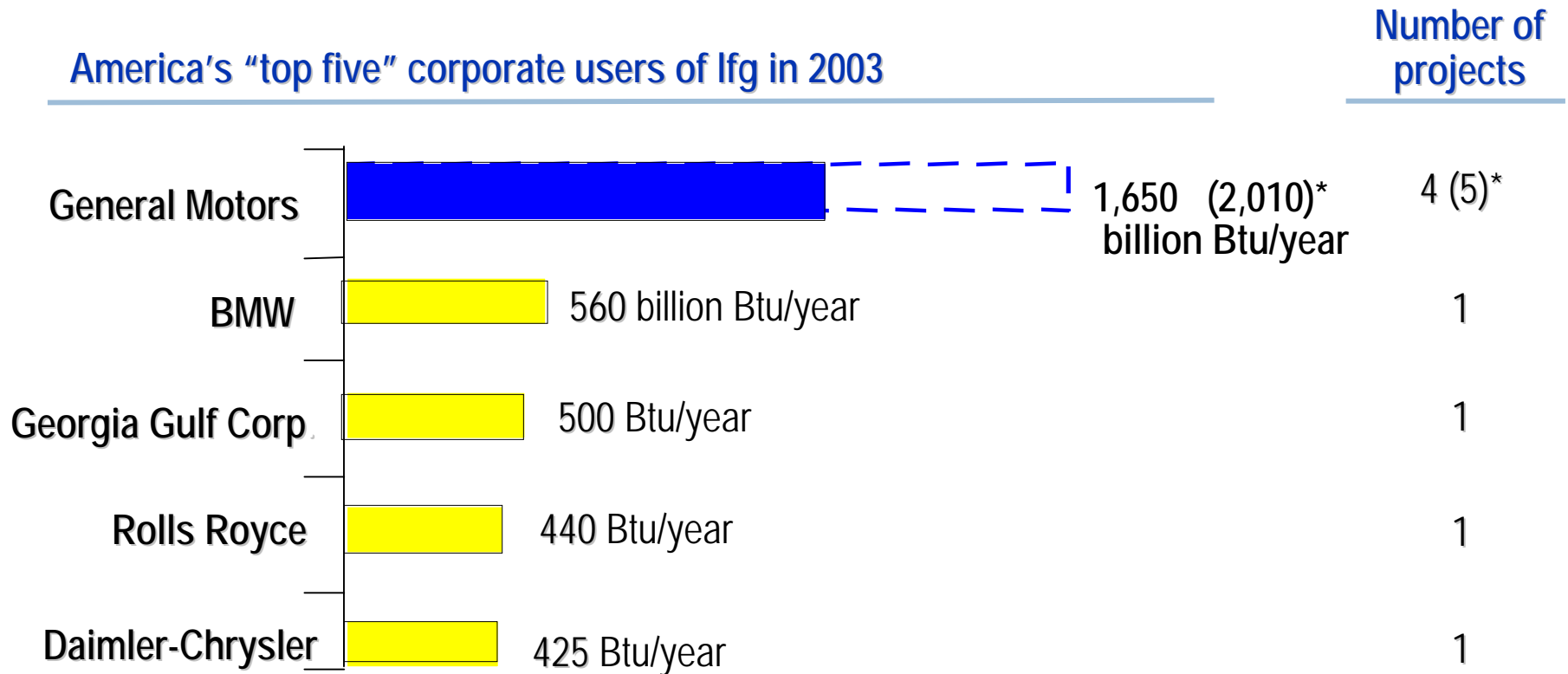
- **Greenhouse Gas Issues**
- **Renewable Energy 1.5% of all GMNA Energy**
- **ISO – 14001, all GM facilities certified – energy reduction is a major element of environmental management**

GM and Green Power Management

GM is the largest corporate user of landfill gas for thermal energy in the US

GREEN POWER MARKET DEVELOPMENT GROUP

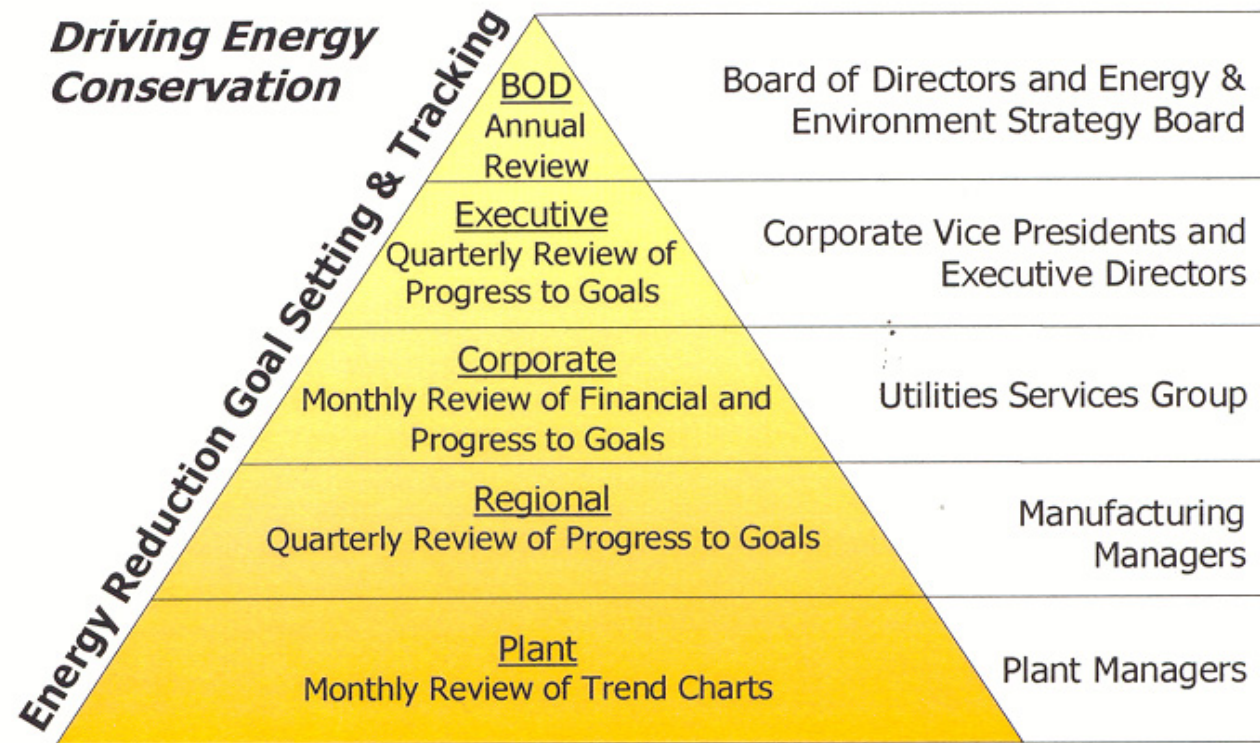
America's "top five" corporate users of lfg in 2003



* Includes Oklahoma City project announced on September 17, 2003. Not operational in 2003
 Source: U.S. Environmental Protection Agency (Landfill Methane Outreach Program)



Enablers for Successful Energy Management Programs



Enablers for Successful Energy Management Programs

The Organization must Drive Results

- Operate with an Integrated Energy Business Group
- Own the budget, assets, resources for GMNA plants
- Responsible for procurement, engineering and operation at plant level
- Accountable for achieving goals

Enablers for Successful Energy Management Programs

Monitoring and Recognition

- **Regional and Global Goals**
- **Local Plant Goals and Plant Manager Review**
- **Regularly scheduled focus (monthly scorecards)**



GM and WasteWise ...

GM was recognized in 2003 with two WasteWise
Partner of the Year Awards:

Very Large Organization

Climate Change



GM and WasteWise ... Highlighting Specific GM Waste Management Strategies and Actions

- **GM views their waste management practices very strategically and involves all of its employees, as well as its supply chain.**
- **GM's views its supply chain as an integral part to the materials management equation.**
- **In 2002, GM prevented more than 3,000 tons of waste through their voluntary waste management practices by investing in new technologies and identifying innovative waste reduction strategies.**
- **GM recently spearheaded a new EPA Supply Chain Initiative called SP: Suppliers' Partnership for the Environment.**



GM Supports *Supplier* Voluntary Initiatives ...

SP's Website: www.supplierspartnership.org

Suppliers Partnership for the Environment (SP)

One Thomas Circle, NW, Tenth Floor
Washington, DC 20005
Phone (202) 530-0096 * Fax (202) 530-0659
www.supplierspartnership.org

What is SP?
The Suppliers Partnership for the Environment (SP) is an innovative partnership between automobile and suppliers and the Environmental Protection Agency (EPA). SP membership by creating new and innovative business relationships that improve the environmental protection that improve the environment of the automobile supply chain. SP provides a forum for automotive and vehicle suppliers to work together to develop and implement environmental best practices.

How Does SP Provide Value to Its Members?
SP provides value to its members by:

- Providing a forum for companies to work together through task forces and work groups to address environmental issues
- Providing facility-specific technical assistance
- Identifying and addressing externally driven environmental issues
- Retaining the costs savings realized through environmental improvements

ADDITIONAL RESOURCES:

- GMSupplyPower --
<http://www.gmsupplypower.com/>
- GM Ability --
<http://www.gm.com/company/gmability/environment/>
- GMW3059 - Restricted and Reportable Substances this site also has the European Union - End of Life Vehicle Information --
<http://www.gmw3059.com>
- IMDS - International Material Data System --
<http://www.mdsystem.com>



SUPPLIERS PARTNERSHIP FOR THE ENVIRONMENT™

MISSION

Provide a self-sustaining forum for large, medium and small service and product vendors who deal with small, mid-sized and large vehicle manufacturers to develop and share tools, information, knowledge, good practices and technical support to ensure that the suppliers' products and their processes provide environmental improvement and cost savings to SP participants.



GM and WasteWise ... for U.S. facilities

- Partners since March 1994
- Since 1994, we've recycled...
 - 40 thousand tons of plastics
 - 306 thousand tons of wood
 - 437 thousand tons of paper
 - 14.4 million tons of metals
- In just the past 2 years, we've reduced the amount of waste generated annually by...
 - 100 thousand tons



GM's Approach to Waste Reduction

EPA WasteWise is integrated with our Operations:

- ISO 14001 system
- Design for the Environment initiatives
- UAW-GM, WE CARE “action strategy”
- Resource Management program
- Chemicals Management program
- Oil Management program



GM's Approach to Waste Reduction

With support from WasteWise, GM is striving to:




- reduce the total amount of waste generated at our facilities by an additional 15 % by 2005, and
- continue to increase recycling rates by 15 percentage points by the end of 2005.

2002 WasteWise Climate Profile: General Motors Corporation

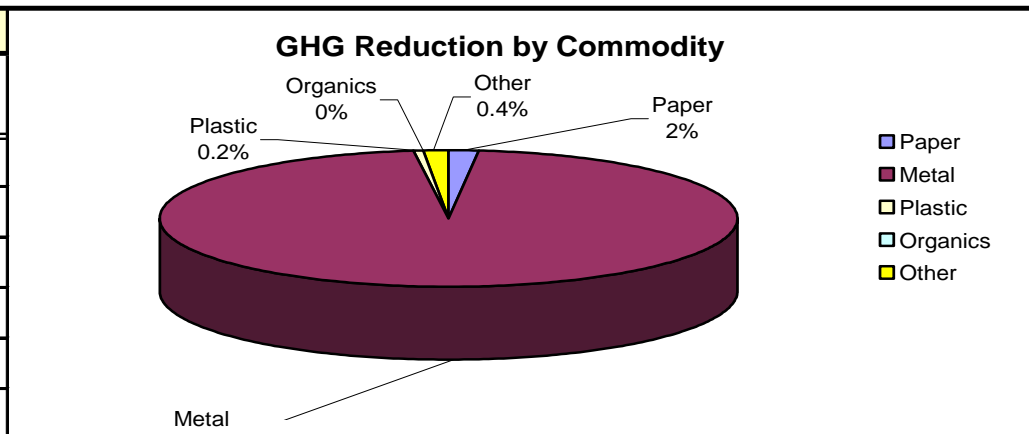


Greenhouse gases (GHGs) are emitted at nearly every stage of a product's life cycle, including during waste management. How we choose to manage this waste has significant implications for GHG emissions. Alternative waste management practices, such as waste prevention and recycling, can result in significant reductions in GHG emissions.

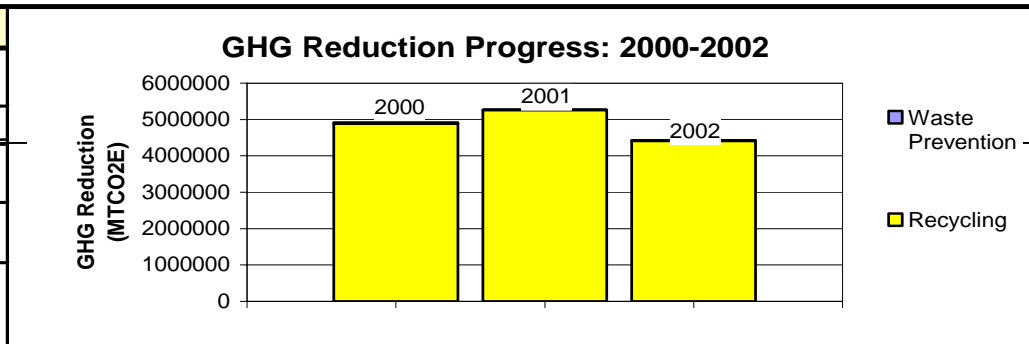
This profile describes the GHG emission reductions achieved as a result of recycling and waste prevention activities. Please note that these calculations use CO₂ equivalents rather than carbon equivalents as the baseline emissions generated by landfilling waste. Emission reductions represent the difference between this baseline and the GHG emissions resulting from alternative waste management practices.

GHG Reduction Summary				
Waste Management Activity	GHG Emission Reductions (MTCO ₂ E)	Approximately equal to:		
		 The annual emissions from the use of central air conditioning in households	 The annual carbon dioxide stored by this many acres of established, rapidly growing trees	 The annual emissions from the power consumption in households
Waste Prevention	19,289	25	158.17	2,508
Recycling	4,413,361	5,693	36,189.56	573,737
TOTAL	4,432,651	5,718	36,347.73	576,245

GHG Reduction by Commodity		
Commodity	GHG Reductions (MTCO ₂ E)	Percent of Total
Paper	74,804	1.7%
Metal	4,277,616	96.5%
Plastic	13,238	0.3%
Organics	23	0.0%
Other	66,970	1.5%
TOTAL	4,432,651	100.0%



GHG Reduction Progress: 2000-2002			
Waste Management Activity	2000	2001	2002
	GHG Reductions (MTCO ₂ E)		
Waste Prevention	34,008	8,972	19,289
Recycling	4,887,448	5,264,905	4,413,361
TOTAL	4,921,456	5,273,877	4,432,651





GM's use of the WASTE Reduction Model (WARM): Lessons Learned

In 2002, GM prevented more than 3,000 tons of waste through their waste management practices: investing in new technologies, identifying innovative waste reduction strategies, and using just plain common sense.

WARM: GM Calculates and Uses Carbon Dioxide (CO₂) Equivalents rather than Carbon (C) Equivalents (Carbon x 3.67 = Carbon Dioxide)

- 4.4 million metric tons of CO₂ equivalent (CO₂e) were prevented from entering the atmosphere due to the GM's recycling practices in 2002; and
- 19,289 metric tons of CO₂e were prevented from entering the atmosphere due to GM's waste prevention practices in 2002 and cited in the 2003 Annual WasteWise Report.



GM's use of the WASTE Reduction Model (WARM): Lessons Learned

- One of the most important lessons learned in the deployment of major strategic initiatives are the roles of the stakeholders from Senior Level Management through to the Employees.
- Before deploying any program, Senior Level Management requires
a business case which provides cost saving to the bottom line...and
- Employees require feedback from their management in support of their work practices...especially those practices that come from volunteering their time and energy.

**‘The Business Case sells the program,
while the employees make it happen.’**



GM Janesville Truck Assembly

Over 4,500 employees

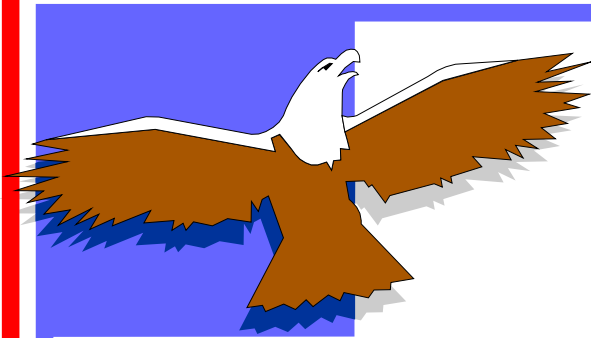
- **Certified to the ISO 14001 Environmental Mgt. System standard**
- **Recycles approximately 23,000 tons of material per year**





ISO 14001 Goals

- **Reduce plant wide electrical usage by 3% compared to 2002**
- **Reduce plant wide water usage by 3% compared to 2002**
- **Reduce the quantity of waste materials sent to landfill by 5% compared to 2002**



Janesville's Environmental Slogan:

SOAR towards Environmental Excellence

We can achieve environmental excellence by:

Stopping pollution

Obeying laws

Always improving

Reducing waste





Achieving Cost Savings and GHG Emission Reductions... *Today and into the Future*

- **EPA Climate Leaders**
- **Green Power Partnerships (EPA and the WRI)**
- **EPA Energy Star Programs**
- **EPA Supplier Partnership for the Environment**
- **BRT Climate RESOLVE**
- **DOE Climate VISION**

GM Corporate Responsibility & Sustainability Report

<http://www.gm.com/company/gmability/>

