



# Corporate Responsibility & Sustainability Report

2001-2002

View the full report online at [www.gmresponsibility.com](http://www.gmresponsibility.com)

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## Executive statements:

### From our CEO

Questions about corporate responsibility and sustainable development have recently commanded headlines around the world. At General Motors, we've spent years focusing on these very issues, both in how we run our business and how our products influence the world around us. In this report, we are pleased to review our progress and performance.

GM enjoys a long tradition of accountability, integrity, and transparency that has helped establish our reputation as a leader in corporate responsibility. We place a high value on appropriate financial checks and balances, and on communicating clear, consistent, and truthful information about our performance.

For this legacy, we owe a great debt of gratitude to our current chairman, Jack Smith, as well as many of our former leaders and Board members, including the late Rev. Leon H. Sullivan, whose "Global Sullivan Principles" serve as the aspirational framework for our corporate responsibility initiatives. These and other GM leaders helped set high standards of integrity and conduct that I am personally committed to continuing and building upon in the years to come.

GM is using its vast technological resources to build more efficient cars and trucks. We continue to improve the performance of our vehicles, as well as our facilities, as we have for decades. And, we've taken a leading role in developing tomorrow's advanced technology vehicles.

We believe one of the keys to corporate responsibility is our commitment to creating sustainable transportation through the development and promotion of the "hydrogen economy." GM is at the leading edge of this evolution, as demonstrated most recently by our Hy-wire concept vehicle — the world's first drivable vehicle combining fuel-cell propulsion with by-wire technology.

At GM, our mission is to build great cars and trucks, by delivering automotive innovation that improves people's lives, and to do so the right way, the way that GM stakeholders expect. We understand that upholding this commitment is much more than a one-time exercise — it is a way of doing business.

Toward that end, we set annual targets for our economic, environmental, and social progress, and measure our performance against those targets. We then publicly report our results by publishing them in this annual report, using the standardized reporting guidelines set forth by the Global Reporting Initiative. This allows our stakeholders to evaluate our performance in a consistent and open manner.

We are committed to upholding our legacy of proactive corporate responsibility, and to finding innovative solutions to our society's economic, social, and environmental challenges. We invite you to review our progress, and to join us as we continue our journey for ever-better results.

Rick Wagoner  
President and Chief Executive Officer

## Vice Presidents' Statement

For General Motors, corporate responsibility and sustainability means respecting today's and tomorrow's economic, environmental and social impacts.

We are working hard to ensure that our company is a responsible corporate citizen. As an enterprise with global reach, we are committed to developing technology and innovation that will improve peoples' lives. We have technologies and products we want to bring to a global market. These technologies can help nations with economic growth, job creation, and improved local living standards — and that is why we will continue to be actively involved in corporate responsibility and sustainability efforts.

It is important to the men and women of GM to see our company realize its full potential by doing things the right way, around the globe. Integrity transcends borders, language, and culture. It is one of GM's core values, and is articulated in our Winning With Integrity, the foundation of our guidelines for employee conduct. In addition, GM's corporate responsibility efforts are guided by the Global Sullivan Principles, which emphasize the common goals of human rights, social justice, and economic opportunity.

We have placed a priority on providing clear, consistent, and truthful communication about our performance. We understand that we will be held accountable for our actions. Therefore, this report highlights critical business issues, communicates information to judge our performance, and provides key metrics to measure our progress.

Highlights from the report include:

- Our AUTOnomy and drivable Hy-wire concepts, the first vehicles designed from the ground up around a fuel cell propulsion system and the first to combine fuel cells with by-wire technology, providing a clear vision of the potential of the coming hydrogen economy.
- Safe driving initiatives, including the donation of child safety seats to low-income families and at-risk children
- Philanthropic contributions of almost \$83 million, including GM GlobalAid and GM Volunteer Plu\$
- A reduction of material going to landfills from our North American facilities of 54% since 1997
- A reduction in lost work day cases in our global operations of 85% since 1995
- The incorporation of more than 30,000 tons of recycled materials into new Vauxhall and Opel vehicles since 1991

GM's vision is to be the world leader in transportation products and related services. Clearly, our responsibility lies in building great cars and trucks in a sustainable manner. We invite our stakeholders to regularly monitor our progress online at [www.GMability.com](http://www.GMability.com).

Rod Gillum  
Vice President  
Corporate Responsibility and Diversity

Elizabeth Lowery  
Vice President  
Environment and Energy

October 2002

MANAGEMENT & VISION

**“ It is our goal to be responsible contributors to the betterment of society through our products and services and through the manner in which we provide them to markets. Balancing the expectations of corporate responsibility is a challenge, but through this balancing process we hope and expect that we will enhance public respect for our company. ”**

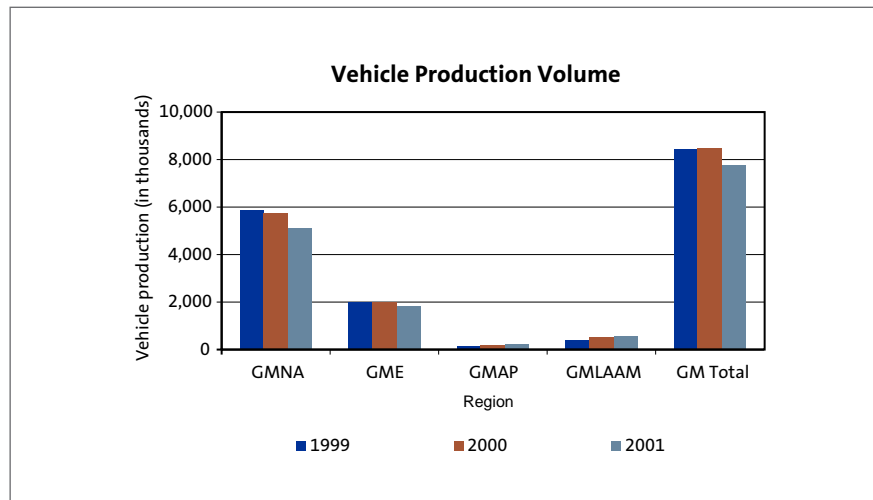
- Tom Gottschalk,  
Executive Vice President, Law & Public Policy and General Counsel

MANAGEMENT & VISION

## Corporate profile:

General Motors, the world's largest vehicle manufacturer, designs, builds and markets cars and trucks worldwide. In 2001, we earned \$1.5 billion on net sales of \$177.3 billion, excluding special items. We employ approximately 365,000 people globally.

Founded in 1908, GM today has assembly, manufacturing, distribution and warehousing operations in more than 53 countries and our vehicles are sold in approximately 200 countries.



We have been the world's automotive sales leader since 1931. In 2001, we sold more than 8.5 million cars and trucks — more than any other automaker — and controlled 15.1 percent of the world vehicle market. Our major markets are North America (GMNA), Europe (GME), Asia-Pacific (GMAP), and Latin America, Africa and the Middle East (GMLAAM).

Our vision is to be the world leader in transportation products and related services. At General Motors we aim to maintain this position through enlightened customer enthusiasm and continuous improvement driven by the integrity, teamwork, innovation and individual respect and responsibility of our employees.

Our organization is separated into four operating regions:

- General Motors North America (GMNA)
- General Motors Europe (GME)
- General Motors Asia Pacific (GMAP)
- General Motors Latin America, Africa and the Middle East (GMLAAM)

Our cars and trucks are sold under the following brands:

Buick, Cadillac, Chevrolet, GMC, Holden, Hummer, Isuzu, Oldsmobile, Opel, Pontiac, Saab, Saturn, Vauxhall

Additional information on our brands is available on our corporate web site [www.gm.com](http://www.gm.com).

We not only aim for leadership in automotive products but also in related services. Our OnStar division is the industry leader in vehicle communications and information services. With over 2 million subscribers OnStar has approximately 80% market share.

We also operate one of the world's largest and most successful financial services companies, General Motors Acceptance Corporation (GMAC), which offers automotive, mortgage and business financing and insurance services to customers worldwide.

Our major subsidiaries are:

- General Motors Acceptance Corporation
- GM Locomotive Group
- Hughes Electronics Corporation
- Allison Transmission Division

As part of its global growth strategy, we have major alliances with Fiat Auto SpA, Fuji Heavy Industries Ltd., Isuzu Motors Ltd. and Suzuki Motor Corp. We also have strong technology collaborations with Toyota Motor Corp. and Honda Motor Co., and vehicle ventures with Toyota and Renault SA.

### **Where We Operate**

As the world's largest automotive corporation, we sell vehicles in more than 200 countries, and have assembly, manufacturing, distribution or warehousing operations in more than 53 countries.

See a directory of our global operations.

### **Ownership**

We are a publicly traded company, listing our stock on the following exchanges:

- New York Stock Exchange, Inc.
- Chicago Stock Exchange, Inc.
- Pacific Stock Exchange, Inc.
- Philadelphia Stock Exchange, Inc.
- Montreal Stock Exchange
- Toronto Stock Exchange
- Borse Frankfurt am Main (Frankfurt on the Main, Germany)
- Borse Dusseldorf (Dusseldorf, Germany)
- Bourse de Bruxelles (Brussels, Belgium)
- Courtiers en Valeurs Mobilieres (Paris, France)
- The London Stock Exchange
- Customer Diversity

Diversity in the marketplace is a key priority. We are intensifying the way we market our divisions and vehicle brands to our customers. In the past, we emphasized our individual brands. Currently, the corporate brand push communicates our quality, safety and innovations before directing customers to the individual vehicle divisions our customers have known for decades.



MANAGEMENT & VISION

## *Integrated management:*

### Core values

We have defined a set of six core values that guide our global business conduct. These are:

1. Continuous Improvement
2. Customer Enthusiasm
3. Innovation
4. Integrity
5. Teamwork
6. Individual Respect and Responsibility

These values are the basis upon which all of our employees conduct their day-to-day business. The core value of integrity is the foundation of our guidelines for employee conduct, entitled, "Winning with Integrity — Our Values and Guidelines for Employee Conduct."

These guidelines demonstrate our global commitment to the achievement of business success with integrity. The guidelines are published as a series of information booklets, which cover personal integrity, integrity in the workplace, integrity in the marketplace, and integrity in society and its communities. In line with the global nature of our organization, our employees are able to obtain copies in nine languages.

Each booklet in the series discusses aspects of Winning with Integrity, explaining our policies and expectations, offering examples of situations employees might face, and suggesting how they ought to deal with them.

### Global Sullivan Principles

In May 1999, we announced our support for the Global Sullivan Principles, which are consistent with our internal policies and principles, including our Winning with Integrity guidelines. The Principles, developed by the late Reverend Leon H. Sullivan, have their roots in the 1977 Sullivan Principles for South Africa, and provide guidance to companies across the globe regarding core issues such as human rights, worker rights, the environment, community relations, supplier relations and fair competition.

"The objectives of the Global Sullivan principles are to support economic, social and political justice by companies where they do business; to support human rights and to encourage equal opportunity at all levels of employment including racial or gender diversity on decision making committees and boards; to train and advance disadvantaged workers for technical, supervisory and management opportunities; and to assist with greater tolerance and understanding among peoples; thereby, helping to improve the quality of life for communities, workers and children with dignity and equality."

— The Reverend Leon H. Sullivan

We remain committed to the ideals outlined in Global Sullivan Principles through endorsement of, and participation in, the Global Sullivan Principles Core Group Committee.

**Commitment**

GM demonstrated its commitment to the Global Sullivan Principles by serving as a sponsor for the Third Biennial Leon H. Sullivan Summit Dinner held in Washington, D.C., in June 2002.

Previously, we announced the creation of a new group of scholarships in honor of the late Rev. Leon H. Sullivan. At the Sullivan Summit Dinner in 2002, we were proud to introduce two of 10 GM Sullivan Fellows representing nine colleges and universities. The GM Sullivan Fellowship Program, a partnership with the United Negro College Fund, is designed to perpetuate the Global Sullivan Principles in institutions of higher education. The program requires the GM Sullivan Fellow and their designated faculty member to develop a workshop or course utilizing the knowledge gained during the Fellow's internship. This workshop or course is then presented to faculty and students. Colleges and university programs selected are awarded \$10,000. The GM Sullivan Fellowship Program grants total \$100,000, and recipients will be known as GM-Sullivan Scholars. GM was a sponsor of the dinner. Notable speakers for the event included U.S. President George W. Bush and President Olusegun Obasanjo, Federal Republic of Nigeria.

## MANAGEMENT &amp; VISION

*Integrated management:*

## Management Structure

Our business is overseen by the Board of Directors, who are responsible for electing the officers of the Corporation, setting policies, and overseeing management.

### List of Elected Officers and Operating Executives

Our subsidiaries that are corporations have independent boards of directors responsible to General Motors. Our two largest subsidiaries are General Motors Acceptance Corporation (GMAC) and Hughes Electronics Corporation. Our automotive business is managed through strategy boards that ultimately report to the GM Board of Directors.

The Automotive Strategy Board (ASB) is responsible for the global strategic direction of our automotive business, which accounted for 79% of our sales and revenues in 2001. Feeding into the Automotive Strategy Board are Regional Strategy Boards that coordinate operations in each of our major regions:

- North America
- Europe
- Latin America, Africa and Middle East
- Asia Pacific

The General Motors Board of Directors represents our owners' interest in perpetuating a successful business, including optimizing long-term financial returns. The Board is responsible for seeing that the Corporation is managed in such a way to ensure this result. This responsibility is active, not passive. The Board operates under the corporation laws of the State of Delaware (where we are incorporated), Bylaws and our Corporate Governance Guidelines, which were adopted by the Board in 1994 and are periodically updated.

In August 2002, we announced that GM would unconditionally comply with the new Securities and Exchange Commission (SEC) requirement for key officers to certify our financial reporting, and that we will expense options granted to employees beginning in January 2003. Additionally, we have endorsed the new Corporate Accountability and Listing Standards approved by the New York Stock Exchange (NYSE) and have expressed support for the Sarbanes/Oxley Act recently signed into law.

In addition to fulfilling its obligations for increased stockholder value, the Board has responsibility to other stakeholders — our customers, employees, suppliers and the communities where we operate — all of which are essential to a successful business. All of these responsibilities, however, are founded upon the successful perpetuation of our business.

There are currently 12 Board members, including ten non-employee members and two management members. The Board manages the Corporation's business and accomplishes work through a number of Committees. The six standing committees are Audit, Capital Stock, Director Affairs, Executive Compensation, Investment Funds, and Public Policy. Except for the Investment Funds Committee, committee membership consists of independent Directors only as defined in By-law 2.12.

**Managing Corporate Responsibility and Sustainability**

The Public Policy Committee was created to ensure that we operate our global business in a manner consistent with the rapidly changing demands of society. The main issues reviewed by the Committee include corporate responsibility, automotive safety, energy, environment, diversity, health care, research and development, trade, sustainability, privacy, and economic development. The role of the Committee is to provide public policy guidance to management. This supports our pursuit of business growth within the framework of our core values and our sustainability goals.

Internally, corporate responsibility, government relations, energy and environment, sustainability, economics, diversity, and philanthropy and community relations issues are managed by our Public Policy Center (PPC). The vision for the PPC is to be a lean, global network that proactively advances our position on issues of public policy. To help achieve this vision, the mission of the PPC is to:

- \* Anticipate external trends and changes that could impact our business decisions
- \* Support corporate business and cultural objectives
- \* Develop and execute coordinated public policy strategies
- \* Ensure that our strategic plans and operating practices take into account the changing public policy environment

The Global Coordination Team manages the overall operations and direction of the PPC. Within the Global Coordination Team there are members who represent our four operating regions and the respective Regional Strategy Boards. This management structure provides the Global Coordination Team with a direct link to the strategy and business decisions taken by the Automotive Strategy Board and the Regional Strategy Boards. PPC leadership is provided by our Vice President Environment and Energy, Vice President Corporate Relations and Diversity, Vice President Government Relations, and Chief Economist who report directly to the Executive Vice President Law & Public Policy. These individuals are also part of the Global Coordination Team.

Building on the approach used throughout our businesses, the Public Policy Center promotes a cross-functional team concept, working with a series of cross-sector teams, organized around specific policy issues. The PPC is arranged around four centers of expertise, each of which is responsible for several issues.

We report on the work of the Public Policy Center through the annual production of a corporate responsibility and sustainability report and through the GMability web site, which was launched in February 2001.

The management approaches adopted for specific environmental and social and community issues are discussed in the relevant sections of this report

## MANAGEMENT &amp; VISION

*Integrated management:***Stakeholder Relationships**

We have sought to strategically align ourselves with various organizations, in order to advance our position on issues of global importance. These include the Coalition of Environmentally Responsible Economies (CERES), Business for Social Responsibility (BSR), the World Business Council for Sustainable Development (WBCSD), CSR Europe, and The Nature Conservancy Council. We value the opinion of our stakeholders and actively encourage scrutiny from environmental and safety organizations, academia and community groups. We also value differing regional and country perspectives from around the globe and issues management approaches that consider several disciplines (i.e., economic, environmental and social). We support these alliances through financial and in-kind resources.

**Stakeholder Consultation**

Consultation with stakeholders is an important part of doing business. Through such dialogue we become aware of the views of others and we gain a better understanding of various constituencies. Stakeholder engagement is generally conducted through periodic meetings and advisory council forums. Written communications and surveys provide the basis for other dialogue.

We actively engage stakeholders in various areas of our business. Such engagement allows us to develop policies and positions that are of value to our business, and that are responsive to the needs and concerns of our stakeholders.

The information generated as result of stakeholder engagement programs provides us with a balanced perspective of our position on societal issues and helps us to continuously improve in various areas. Some of the resulting improvements are shown below:

- Development of best practices
- Benchmarking for continual improvement of various processes
- Research
- Regular reporting on progress towards established goals
- Formal and informal agreements with unions and other stakeholder groups
- Feedback used in the design of new products, machinery, equipment and tooling

GM is a member of CSR Europe, a business-to-business network that aims to help companies achieve profitability, sustainable growth and human progress by placing corporate social responsibility (CSR) in the mainstream of business practice. With over 40 company members and 15 national partners, CSR Europe achieves this objective via the following pathways:

- Serving over 50,000 business people and partners annually through print and online publications, best practices and tools
- Offering business managers learning, benchmarking and tailored capacity building programs
- Including CSR issues in stakeholder dialogue and focusing particularly on the European Institutions.

**Community Impact Strategy Team**

This team was formed to identify internal and external issues that may impact us and the communities in which we operate. The goal of this team is to cross-functionally manage strategic processes that take into consideration local community initiatives when determining future actions and announcements. These issues include labor relations, facilities, community relations, philanthropic activities, communications, government relations, economic development, tax, real estate, manufacturing, planning, and purchasing.

**Public Policy Issues**

Balanced public policy solutions to major societal issues are important to our business. Strategic alliances with local, national and international organizations allow us to participate in the development of such solutions.

**Memberships, Sponsorships and Contributions**

We have established and maintained memberships, sponsorships and partnerships with organizations that advance common goals on societal issues affecting public policy. These organizations include The United States Council for International Business, The Conference Board, Business for Social Responsibility and others.

- More information about our key partners
- GM Philanthropic Guidelines

## MANAGEMENT &amp; VISION

## Vision & strategy:

### GM's Vision

At General Motors, we have long recognized that government policies, international relations, environmental performance, and labor and community responsibilities are important elements of our business. Recently, these issues have increased in visibility as the public, government, and non-government organizations (NGOs) have looked to corporations and the private sector to play a leading role in addressing the impact of globalization on living standards, economic development, and environmental improvement.

This increased emphasis from our stakeholders makes GM's commitment to corporate responsibility more important than ever. Our values are clear and are reflected in our Guidelines for Employee Conduct, as well as our commitment to the Global Sullivan Principles. The Global Sullivan Principles, which were developed under the guidance of the late Reverend Leon H. Sullivan, serve as a guide for responsible corporate behavior by emphasizing the common goals of human rights, social justice, and economic opportunity. We use the Global Sullivan Principles as the foundation for GM's corporate responsibility initiatives. We measure our performance against the Global Sullivan Principles using the Global Reporting Initiative guidelines.

As the world's largest automotive company, there is much we can do what we can to improve people's lives today and help ensure a better world for future generations. Through our products, our global reach, the ingenuity and dedication of our people, and the company's contribution to the economy, we strive to be a positive force throughout the world.

Innovation is a priority at GM—it has long been one of the hallmarks that have made GM great. Our renewed commitment, our drive, is to build on that heritage. We are focused on thinking beyond "the way it's done" to new ways—better ways—it can be done. Working as a team, building a collective passion for new ideas, we're striving for automotive innovation that stands out from the competition and results in great cars and trucks. GM is committed to delivering automotive innovation that improves people's lives.

#### GENERAL MOTORS' VISION

Our vision is to be the world leader in transportation products and related services.

"Starting with our shareholders and employees, it is in everyone's interest that GM conducts its business with fidelity to our stated values. Internally, we apply a values-based set of principles as part of our Winning With Integrity program, which includes expectations regarding our business conduct. We also endorse the Global Sullivan Principles, developed by the late Rev. Leon Sullivan, who was for many years a director of General Motors. The Global Sullivan Principles state aspirational guidelines for companies with respect to human rights, environmental responsibility, and fair competition, among other values, which we want to reflect where ever in the world we do business."

— Tom Gottschalk  
Executive Vice President  
Law & Public Policy and General Counsel

We are a leader in introducing innovative new technologies to the mass market. Some examples include:

- The AUTOnomy concept, the first vehicle designed from the ground up around a fuel cell propulsion system, and the first to combine fuel cells with by-wire technology, which allows steering, braking and other vehicle systems to be controlled electronically rather than mechanically. The AUTOnomy concept provides our vision of the potential of the coming hydrogen economy.
- The GM Hy-wire, the world's first drivable concept vehicle that combines a hydrogen fuel cell with by-wire technology.
- OnStar, the unrivaled industry leader in in-vehicle communications, with more than two million subscribers, and 250% growth in 2001.

Innovation is not limited to our products. Through innovative production processes, we are reducing the environmental impacts of our plants. GM has reduced energy consumption by 11 percent at its North American facilities since 1995, and has achieved a 2.5 percent reduction globally since 1999. We also have eliminated the use of many materials in our production processes and have developed innovative new uses for waste. Since 1997, we have reduced the amount of material going to landfill by 54% in our North American operations alone by increasing the recycling and reuse of our waste materials as new useable products. In addition, we have initiated land-management initiatives in partnership with local governments to redevelop former GM manufacturing facilities and sites. Our goal is to convert these sites into productive, job-creating complexes that benefit local communities.

We are continuing our focus on health and safety initiatives, and on developing the skills and capabilities globally of our workforce. We also recognize a responsibility to educate the public, and are expanding our education initiatives at the community level.

- Workplace Health and Safety
- Product Safety
- Safety Technologies
- Safe Driving
- Employee Training and Education
- Outreach and Education

Working with others is an important and necessary part of doing business. We will continue our long history of building strong partnerships with our employees, customers, investors, governments, communities, our dealers and others in order to be responsive to the needs and concerns of our various stakeholders. By working with other businesses, governments, and NGOs, we are taking steps toward a responsible and sustainable future. Some examples of the results of these partnerships include:

- \* The Duramax Diesel V8, developed with Isuzu, which is considered a world-class powerplant in our heavy-duty pickups in North America.
- \* Our joint ventures with Fiat, where powertrain and purchasing efficiencies have helped both companies with their respective European restructuring efforts.
- \* The Sustainable Mobility project with the World Business Council for Sustainable Development and twelve company members, which considers the full impacts of mobility, and will provide a renewed focus on these wide issues and their impact on the automotive industry.



GM will realize its vision of industry leadership by engaging in our business the right way around the globe. Clearly, our responsibility lies in building great cars and trucks, and in balancing the environmental, social, and economic impacts of our industry.

### **SUSTAINABLE MOBILITY PROJECT**

In 1999 General Motors conceived a project to help determine how the world's mobility needs could be met on a sustainable basis. Realizing that this complex challenge would require the participation of many stakeholders, GM asked the World Business Council for Sustainable Development, headquartered in Geneva, to sponsor the project and to help interest other organizations in the effort. Today, twelve major corporations, including six of the world's ten largest, along with several top consulting organizations, are leading a comprehensive analysis which focuses mainly on sustainability issues created by the role of the road vehicle in developed and developing countries.

Co-chaired by GM, Shell and Toyota, the project has convened stakeholder dialogues in Tokyo, Brussels, Washington, D.C., Sao Paulo, Prague, Beijing, Capetown and Manila, to draw on the views of representatives of government agencies, academia, labor and non-governmental organizations. It has also published *Mobility 2001*, an arm's-length report on the state of mobility and its sustainability, worldwide, at the end of the 20th Century, developed by a 40-person team led by MIT. By year-end 2003, the project will respond to the "grand challenges" outlined in that report, with its visions of sustainable systems of mobility for the year 2030. You can follow the progress of the project at [www.sustainablemobility.org](http://www.sustainablemobility.org).

This project is another example of GM's determination to integrate economic, environmental and social objectives into our long-term strategies and to achieve a balance among them which will prove sustainable long into the future.

## MANAGEMENT &amp; VISION

*Vision & strategy:*

## GM &amp; the market place

Because we strive to be a responsible enterprise, we support sustainability. We were a member of the World Business Council for Sustainable Development (WBCSD) working group on Sustainability Through the Market. The goal of this project was to take a more holistic approach to sustainable production and consumption, by promoting a better understanding of the market and how it functions as a system rather than by focusing on isolated elements.

This project identified seven keys to achieving sustainability through the market. We support these key concepts as they help us more fully integrate sustainability into our business plans. The key concepts, and examples of their integration into our business, include:

**Key 1: Innovate — Novel technical and social resources; new ways to improve lives while boosting business.**

A fleet of hybrid buses using the Allison Hybrid Drive System is being used in several major U.S. cities. If the Allison Hybrid System powered the 13,000 transit buses in the nine largest U.S. cities, 40 million gallons of fuel would be saved per year, equivalent to the fuel savings from more than 500,000 small car hybrids.

In 2002 GM and the World Resources Institute (WRI) announced the Green Power Market Development Group, dedicated to building corporate markets for projects such as the use of landfill gas as a factory boiler fuel. Three General Motors plant to utilize landfill gas as an energy source.

**Key 2: Practice Eco-efficiency — Economic benefit and environmental performance**

This management strategy combines environmental and economic performance. In short, it means creating more value with less impact. Some few examples of how eco-efficiency is a way of business at GM include:

- We have instituted a chemicals management system in our facilities that puts a single supplier in charge of all chemicals coming into a plant. The supplier is paid based on production, not the amount of chemicals used, which provides an incentive to reduce chemical use.
- We pay close attention to land use. For example, we have a nature preserve at our proving ground in Brazil that we have reforested with native trees. At our GM of Canada headquarters in Oshawa, we have reforested 270 acres to create the McLaughlin Bay Wildlife Reserve.

**2002 WORLD SUMMIT**

We participated in the World Summit on Sustainable Development held in Johannesburg, South Africa, in August 2002. This forum allowed us to discuss our long-term vision for sustainable mobility, as well as the role corporations can play in addressing global challenges relating to energy issues, biodiversity, and health.

**Key 3: Move from Stakeholder dialogues to partnerships for progress — Shared understanding, aligned action and social inclusion**

We believe the best way to meet the many complex issues facing us is to include diverse input in our decision making process, to gather the best ideas, and keep a collective eye on a common goal. Vauxhall, along with 19 other business and government bodies, are partnering with the Sustainability: Integrated Guidelines for Management (SIGMA) Project. The goal of SIGMA is to create a methodology for a company organization to integrate sustainability into business practices.

Opel has launched a stakeholder forum on sustainable mobility, bringing together representatives of academia, civil society, interest groups and media to identify expectations, challenges and new concepts for sustainability within the company. Dialogue is centered around a number of issues including how Opel can achieve a sustainable business with sustainable products and services and what cooperative solutions Opel can offer to fulfilling the objective of sustainable mobility.

GM joined the U.S. EPA's Climate Leaders Program. This program is an industry-government partnership to achieve voluntary reductions in CO2 emissions. As a member, GM has committed to a 10% reduction in CO2 from our North American facilities between 2000 and 2005.

**Key 4: Provide and inform consumer choice — A different type of demand by enhancing appreciation for values that support sustainability**

As we work to build society's awareness of the need to balance economic, environmental, and social issues, we never underestimate the importance of involving young minds in the process. The participation of today's young people will go a long way toward finding workable solutions to future challenges when it is their time to protect our planet, to contribute to economic development, and to act as stewards of the lives of the people of the world. For many years, GM has supported a strong and diverse base of environmental, energy and technology education programs for children in grades kindergarten through twelve.

**Key 5: Improve market framework conditions — A stable, corruption free, socio-economic framework that facilitates positive change**

In the U.S., the government is proposing incentives for the purchase of advanced technology vehicles, and we think this will be an effective approach. For example:

- Provide tax credits for the purchase of advanced technology vehicles and clean fuels for government fleets, and
- Fund R&D to accelerate the development of technology and infrastructure.

**Key 6: Establish the worth of the earth — Environmental conservation and promotion of resource efficiency**

Protecting ecological resources is important to the world's environmental health and well-being. We are involved in many restoration and construction activities throughout the world that go well beyond regulatory requirements. Ponds, wetlands, and forests provide habitats for a variety of plants, insects, birds, fish and mammals, while fulfilling other functions that are critical to the world's existence. We are active in restoring, enhancing and preserving these vital areas. Working with The Nature Conservancy in southern Brazil, we have launched a major initiative to restore and

protect over 30,000 acres of degraded rainforest. This project aims to protect in perpetuity this critical wildlife habitat while stabilizing the environmental health of the Cachoeira River valley, reducing slash and burn clearances and pollution, and creating economic opportunities for nearby communities.

At GM, we are making an effort to reduce our reliance on traditional energy sources. We have reduced global energy consumption by 2.5 percent between 1999 and 2001, in part through energy-efficient ventilation and lighting, and cogeneration.

We also respect water quality worldwide. For example, at our Ramos Arizpe facility in Mexico, the water necessary to produce a vehicle was reduced from 32 cubic meters to 2.2 cubic meters. In addition, most of the facility's wastewater is now recovered and reused.

**Key 7: Make the market work for everyone — Economic benefit and social cohesion**

Stewardship of society is a critical part of corporate citizenship, and ensuring global stewardship is the one of the reasons GM endorsed the Global Sullivan Principles. The Sullivan Principles were developed in 1977 as a code of conduct for companies operating in South Africa during apartheid. In 1999, the Reverend Leon H. Sullivan announced the Global Sullivan Principles of Social Responsibility, which address human rights and economic opportunity-globally. The Global Sullivan Principles provide an aspirational guide for social and ethical business conduct.

In the past, our corporate responsibility programs have been fully integrated into planning for operations in many countries, notably Asia and Latin America. These include building infrastructure into new plants to utilize fully state-of-the-art and best available process technologies for low emissions and manufacturing practices. We are also committed to operating the safest facilities, and providing excellent access to healthcare options. Included in the latter are educational and other efforts in HIV-AIDs, bone-marrow donor and cancer registries, and opportunities that raise the standard of living and job market advancement for the greater good of the global human community. Specifically, we have built and are operating manufacturing and assembly facilities that are among the best in the world for safety, health, education, and wages in Halol, India; Rayong, Thailand; Shanghai, China; Rosario, Brazil; and others.

## MANAGEMENT &amp; VISION

*Key indicators:*

INDICATOR	2001 Performance	Performance against 2000
<i>Economic Indicators:</i>		
Turnover (US\$ in millions)	\$177,260	Down 4% from \$184,632 in 2000
Earnings/(loss) (US\$ in millions)	\$601	Down \$3.9 billion from \$4.452 billion (adjusted) in 2000
Vehicle Production (cars and trucks)	7.79 million	8.49 million
Global passenger car market share (%)	15.1	15.1
Dividend (US\$/share)	\$2	\$2
Employees	365,000	386,000
<i>Environmental Indicators:</i>		
Global energy use (GWh)	33,856	Down 9.9% from 37,578 GWh in 2000
Global carbon dioxide emissions (metric tons)	13.72 million	Down 8.1% from 14.93 million metric tons in 2000
Global non-recycled waste (metric tons)	741,203	Down 19.5% from 920,447 metric tons in 2000
Global water consumption (m3)	66.2 million	Up 7.6% from 61.5 million m3 in 2000
GM sites certified to ISO 14001	96%	81%

INDICATOR	2001 Performance	Performance against 2000
<b>Social Indicators</b>		
Community donations and sponsorships (US\$)	\$82.7 million	Up 5.9% from \$78.1 million in 2000
Diversity: % female employees (U.S. workforce)	20.6%	20.7%
Diversity: % minority employees (U.S. workforce)	23.2%	23.2%
Discrimination charges (GMNA only)	310	Up 14.4% from 271 cases in 2000
Employee satisfaction (% of employees satisfied with their organization as a place to work at the present time)	Global census to be repeated in 2002	58% (first global census conducted in 2000)
Recordable injury rate (per 100 employees, GM Global)	6.1	71% reduction since 1995
Lost time accident rate (per 100 employees, GM global)	0.6	83% reduction since 1995

ECONOMIC INFORMATION

**“Running our business well requires us to focus on building shareholder value. That’s important to all of us. But it also requires us to behave with integrity and ethics.”**

- John Devine  
Vice Chairman and Chief Financial Officer

## ECONOMIC INFORMATION

*Financial performance:*

In challenging and uncertain times success can be about determination. At GM we are committed to leadership and determined to win. We aim for continuous improvement in all that we do and are confident we can achieve our goals. 2001 was a challenging year — one that none of us will ever forget. Despite the challenges it showed our ability to build on the strong foundations laid over the past decade.

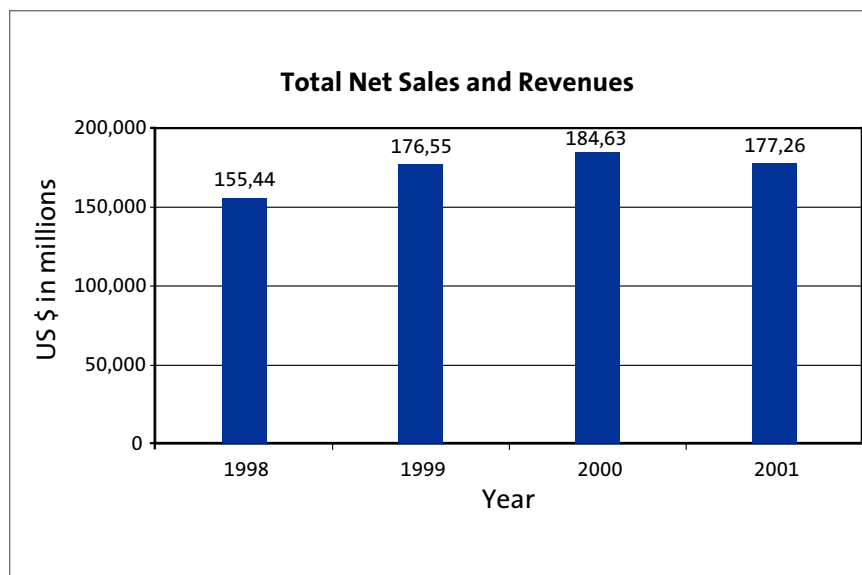
Overall, we were disappointed with our 2001 results. In 2001, while global revenues remained strong at \$177.3 billion (down 4% from 2000), net income fell by \$3.9 billion to \$0.6 billion and earnings totaled \$3.23 per common share, down from \$8.58 in 2000, excluding special items. Although a respectable performance when compared with that of many of our competitors, our margins were well below our expectations and our targets.

- \* In North America, a weakness on the car side of our business was tempered by our success in trucks. While our cost-cutting efforts continued, they failed to offset the downward pressure on prices. As we move into 2002, we are aggressively pursuing additional structural and material cost reductions, and intensifying our focus on cash generation.
- \* GM Europe again posted a significant loss for the year. We have announced a broad restructuring in Europe, which is aimed at returning our European operations to profitability. It is a challenging plan with tough targets.
- \* Our Asia Pacific operations returned to profitability in 2001, due in large part to the exceptional performance by Holden in Australia.
- \* Our Latin America, Africa, and Mid-East region posted a loss, due largely to the currency devaluation in Argentina and pricing pressures throughout the region.

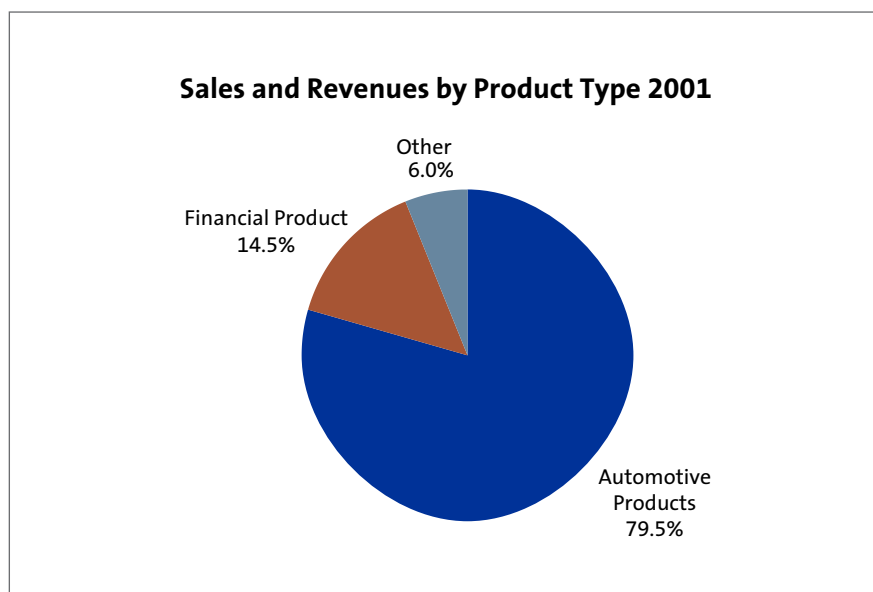
Additional information on our financial performance.



## ECONOMIC INFORMATION

*Financial performance:***SALES AND REVENUES BY PRODUCT TYPE (US\$ in millions)**

	1998	1999	2000	2001
Automotive Products	\$129,054	\$146,056	\$147,400	\$140,703
Financial Products	\$18,284	\$20,451	\$24,005	\$25,769
Other	\$8,107	\$10,051	\$13,227	\$10,788
Total Net Sales and Revenues	\$155,445	\$176,558	\$184,632	\$177,260



#### WORLDWIDE NET EARNINGS FROM CONTINUING OPERATIONS (US\$ in millions)

1998	\$3,049 million
1999	\$5,576 million
2000	\$4,452 million
2001	\$601 million

Note: Geographic distribution not available

#### WORLDWIDE EARNINGS BEFORE INTEREST AND TAX (EBIT) (US\$ in millions)

1998	\$11,314 million
1999	\$16,444 million
2000	\$16,397 million
2001	\$9,959 million

Note: Geographic distribution not available

## GROSS MARGIN (Pursuant to GRI definition)

1998	2.0%
1999	3.2%
2000	2.4%
2001	0.3%

Note: Geographic distribution not available

## DEBT/EQUITY RATIO

	1998	1999	2000	2001
<i>Automotive, Communications and Other Operations</i>				
Long-term debt to the total of this debt and equity	58.1	42.3	30.8%	72.6%
Long-term debt and short-term loans payable to the total of this debt and equity	61.8	48.2	36.6%	76.5%
<i>Financing and Insurance Operations</i>				
Total Debt to Total Stockholder's Equity	10.8 :1	10.9 :1	9.5 :1	9.4:1
Dividends (US\$)	\$2/Share	\$2/Share	\$2/Share	\$2/Share

## ECONOMIC INFORMATION

*Labor:*

In 2001, our worldwide payrolls from continuing operations totaled \$19.8 billion, down 5.3% from \$20.9 billion in 2000. This is against the 6.2% reduction in employees worldwide between 2000 and 2001.

In the U.S., payrolls totaled \$8.5 billion down 9.6% from \$9.4 billion in 2000. Consequently, the average labor cost per hour for the U.S. hourly work force, which includes both wages and benefits, was \$57.76, an increase of 10.7% over 2000. This is significantly higher than the all-manufacturing hourly labor cost in the U.S. In 1999, the latest year available, our labor cost (\$50.51) was 2.6 times the U.S. all-manufacturing rate of \$19.20.

## EMPLOYMENT BY REGION AND SUBSIDIARY

	1998	1999	2000	2001
GM North America	226,000	217,000	212,000	202,000
GM Europe	94,000	91,000	89,000	73,000
GM Latin America, Africa, Middle-East	24,000	23,000	24,000	23,000
GM Asia Pacific	10,000	10,000	11,000	11,000
GMAC Financial Services	24,000	27,000	29,000	29,000
Hughes	15,000	<sup>1</sup> 11,000	2,000†	14,000
Other (Allison Transmission Division, GM Locomotive Group, GM Service Parts Operations)	13,000	12,000	12,000	13,000
Total	406,000	391,000	389,000	365,000

<sup>1</sup>Restated to exclude Hughes' employees transferred to The Boeing Company

## ECONOMIC INFORMATION

## Philanthropy & community support:

We have a long history of making substantial and varied charitable contributions to deserving external organizations, bringing wide-ranging benefits to the communities in which we live and work. These contributions reach their target group through two primary outlets, the GM Foundation and GM corporate contributions.

In 2001, we contributed almost \$83 million to charitable causes through cash contributions (\$63.9 million), in-kind donations (\$7.6 million) and participation in charity events (\$11.2 million). We donated products, components and other equipment to a variety of educational institutions with automotive service programs or engineering programs, such as universities, colleges, vocational schools, secondary schools and correctional institutions. We have also donated non-product equipment and real estate to selected non-profit charitable institutions that directly benefit the local communities in which we operate. In addition, we participate in a variety of charity events to benefit a diverse group of philanthropic causes and organizations.

- \* Our philanthropic performance and examples of programs supported
- \* Our philanthropic guidelines
- \* Worldwide charitable contributions 2001

### Arts and Culture

Over the years, the GM Foundation has been a major contributor to a variety of arts and cultural institutions. The GM Foundation continues to support these organizations in its effort to promote appreciation of the arts, recognition of diverse cultures and awareness of arts in education programs.

In 2001, GM and the GM Foundation contributed over \$2.7 million to a diverse group of these organizations.

### Education

During 2001, we continued relationships with universities through our Key Institution Program, which comprises schools that have been selected primarily for the quality of their engineering and business programs. Educational contributions totaled \$17.2 million in 2001 of which approximately 80% was directed towards science and engineering, with much of the remainder supporting business education. This support has been primarily in the form of cash grants and equipment donations.

### SMITHSONIAN MUSEUM OF HISTORY

The Smithsonian's National Museum of American History attracts nearly 6 million visitors each year. 'Americans on the Move' will be the Museum's first major exhibition on transportation since the late 1970's and will highlight all modes of transport - road, rail, air and water. General Motors will be the named sponsor of this new transportation exhibition wing.

Detroit Institute of the Arts (DIA) - Center for African American History

The DIA is the sixth largest art museum in the U.S. with more than 60,000 works housed in 100 galleries. Ongoing contributions to the Institute have led to the establishment of the GM Center for African-American Art, which will focus on achievements and influence of African American artists. It is the first of its kind anywhere in the world and its formation brings recognition to the city of Detroit and to our company.

We have also provided grants that match employee contributions through the GM Matching Contributions Program. In 2001, the company matched more than \$882,031, representing more than 2,498 employee contributions to 400 accredited degree-granting institutions and libraries.

In addition to providing grants to colleges and universities, we provide direct support to students. In 2001, we provided 1,073 scholarships, totaling more than \$2.1 million to outstanding engineering environmental, public policy and business students. Many participating students also gained work experience related to their studies through summer internships at our facilities.

In 2000, the GM Foundation funded an initiative, which provides \$200,000 a year for five years to the National Science Foundation of China (NSFC). This relationship was formally announced in November at a ceremony held in the Great Hall of the People in Beijing where we jointly signed the Science Research Cooperation Agreement. This agreement assists Chinese scientists by providing funding for joint research and development projects on transportation and safety, environment, and human health.

We are a major sponsor of World in Motion, an educational program created by the Society of Automotive Engineers (SAE). This program provides the opportunity to demonstrate to students the value of continuing to take mathematics and science courses by showing them how technical disciplines can be readily applied to the world of work. Through this program, SAE provides students with engineering experience and gives them an opportunity to discover and try their hand at what engineers do in the real world. SAE's hands-on interdisciplinary curriculum, integrated into one planned unit is a model program that meets all educational standards.

#### **Disaster Relief**

As one of the world's leading philanthropic donors, we realize that in the midst of crises, the physical and emotional needs of individuals and communities are heightened, and that a rapid response is required. As part of an ongoing effort to strengthen our philanthropic base, reaching farther into the global community, we initiated a new program in 2000, GM Global Aid. This program enables us to quickly direct funds from the GM Foundation to those in crisis, while leveraging our national and international units to contribute vehicles and supplies and, more importantly, to volunteer time. An essential component of the program is a new web site — GM Global Aid — contained in the "GMability" section of [www.gm.com](http://www.gm.com). This site allows our employees across the globe to contribute funds to disaster relief efforts, many of which are matched by the GM Foundation.

On January 26, 2001, a devastating earthquake struck the entire Indian sub-continent. Within hours, the GM Foundation responded with a contribution of \$100,000 to aid in the earthquake relief efforts. In the ensuing days, over 100 of our employees utilized the GM Global Aid web site to contribute approximately \$10,000. In addition, employees at our facility in Gujarat, India, responded with volunteer time, medical and other supplies, and deployed a rescue team to search for survivors of the earthquake. This prompt and speedy response gained favorable comment from the international press, as well as from our own employees.

Following the terrorist attacks on America on September 11, 2001, we were the first major corporation to extend our vast network of resources to the New York Fire Department and police organizations. When all was totaled, GM and our employees contributed almost \$4 million in the aftermath of the East Coast attacks. In addition, over 150 Chevrolet Suburbans and other utility vehicles were donated to the relief efforts. We received significant global media coverage for our innovative participation in these disaster relief efforts. We were highlighted several times in the national media as being the leader in its quick response, thus encouraging other corporations to follow our lead.

In addition to these examples of GM Global Aid intervention, the following contributions were also made to assist individuals in need around the globe:

- \$25,000 for earthquake relief efforts in El Salvador
- \$25,000 for Mississippi River flood relief efforts
- \$25,000 for Texas flood relief efforts
- \$25,000 for earthquake relief efforts in Peru and Chile

#### **Health and Human Service Initiatives**

Cancer research remains one of our key philanthropic priorities. We established the GM Cancer Research Foundation (GMCRF) in 1978 to honor scientists throughout the world who have been selected by their peers for hallmark achievements in research on the causes, prevention, and treatment of cancer. The awards — valued at \$250,000 each — are considered among the most internationally prestigious in medicine. Nine of the GMCRF award winners have subsequently won Nobel prizes for their work. The GM Foundation contributed more than \$1.7 million to the GMCRF in 2001 and has contributed more than \$30 million since its inception.

#### **2002 WORLD SUMMIT**

At the World Summit on Sustainable Development held in Johannesburg, South Africa in August 2001, GM was pleased to donate five new trucks to the Nelson Mandela Children's Fund. The Children's Fund will use these vehicles to provide assistance to HIV positive children in rural areas of South Africa, and support various other AIDS related efforts.

In March 2001, we announced a new cancer research recognition program, the GM Cancer Research Scholars Program. This new fund will provide \$1 million per year to support ongoing research projects. The GM Cancer Research Scholars Program is open to members of the 36 Comprehensive Cancer Centers designated by the National Cancer Institute.

ENVIRONMENT & ENERGY INFORMATION

**“ As a responsible corporate citizen, GM is dedicated to protecting human health, natural resources, and the global environment. That’s why we are continuously improving the performance of today’s vehicles, and the process used to manufacture them, through the use of innovative technologies in a manner that makes good business sense, helps protect the environment, and improves peoples’ lives. ”**

- Elizabeth A. Lowery,  
Vice President, Environment and Energy



## ENVIRONMENT &amp; ENERGY INFORMATION

## Management:

### Management approach

#### GM Environmental Principles

For more than 30 years we have had a formal commitment to a safe and healthy environment. In 1991, we strengthened our commitment with the adoption of the GM Environmental Principles. The Principles apply to our facilities, products and employees worldwide, and provide guidance in the conduct of daily business practices. GM Europe derived its Environmental Guidelines from the GM Environmental Principles.

#### Externally Endorsed Values and Principles

##### CERES Principles

In 1994, we became the first Fortune 50 manufacturing company to formally endorse the CERES Principles. This was a major step in affirming our commitment to environmentally responsible business activities. The original expectations of the endorsement were continuous improvement in:

- \* Public accountability and corporate disclosure
- \* Plant environmental performance
- \* Product performance
- \* Stakeholder relationships

In early 2002, CERES and GM completed a performance review process, which was intended to be a fair, candid, and constructive analysis of GM's performance compared to the original expectations established at the endorsement.

##### CERES is...

- \* The leading U.S. coalition of environmental, investor, and advocacy groups working together for a sustainable future
- \* A community of forward-looking companies that have committed to continuous environmental improvement by endorsing the CERES Principles, a 10-point code of environmental conduct
- \* A common ground where groups with widely different backgrounds, assumptions, and visions find concrete solutions to today's environmental challenges

Information on CERES can be found at [www.ceres.org](http://www.ceres.org)

In the resulting report CERES found that GM had performed at or above the expectations set at the time of the endorsement in the areas of public accountability, plant performance and stakeholder relationships, but had not met overall expectations with respect to fleet fuel economy. Specifically, the report stated:

- \* Public Accountability: That GM's annual environmental and sustainability reports are comprehensive and informative, and that GM is regarded as a leader in promoting sustainability reporting. Additionally, GM has taken a leadership role in the Global Reporting Initiative and its web-based reporting is at the forefront of efforts seeking to advance corporate reporting.
- \* Plant Performance: GM met the original expectations in environmental performance and improved its environmental performance at the facility level in terms of key parameters (criteria air pollutants, facility energy use, greenhouse gas emissions, toxic chemicals, hazardous and non-hazardous waste)
- \* Product Performance: GM has incrementally improved vehicle fuel economy on a model-by-model basis and matches or leads other auto manufacturers in fuel economy for comparable models. GM's fleet fuel economy has not improved and mobile source emissions have decreased only slightly, as GM has responded to market demands by shifting the composition of its fleet to more trucks and SUVs over more fuel-efficient passenger cars.
- \* Stakeholder Relationships: GM has made significant improvements in engaging non-corporate stakeholders in its decisions on environmental performance, by increasing the amount and diversity of engagement with external stakeholders.

(Source: CERES Performance Review of General Motors Corporation, Coalition for Environmentally Responsible Economies, January 2002.)

As a result of our relationship with CERES we have become more accountable for our performance and have come under greater public scrutiny. This helps us to focus on specific initiatives such as finding ways to reduce emissions from our manufacturing facilities, and developing alternative vehicles and fuels.

### **Energy and Environmental Strategy Board**

Energy and environmental trends continue to be of increasing importance to our success. The Energy & Environmental Strategy Board (EESB) is responsible for developing and implementing our global energy and environmental strategy and develops operational business processes to address these trends. Accountable to the Automotive Strategy Board, which is responsible for the global strategic direction of our automotive business, EESB members include senior leaders from Communications, Engineering, Powertrain, Worldwide Facilities/Manufacturing, Public Policy & Legal, and R&D and Planning. The EESB sets the overall direction for global energy and environmental policy within GM. Specifically, the EESB:

- \* establishes targets for energy and environmental objectives
- \* approves energy and environmental initiatives
- \* reviews environmental performance through a set of metrics
- \* manages the overall implementation of the energy and environmental strategy
- \* champions actions that lead to progress toward GM's energy and environmental goals

The EESB provides guidance and support to the Energy and Environmental Strategy Core Team, a team of "subject matter" experts that supports the following energy and environmental strategic initiative teams. Subject matter experts from Communications and Public Policy & Legal functions also support these strategic initiative teams.

- Vehicle Energy
- Vehicle Emissions
- Vehicle Fuels
- Design and Manufacture for the Environment
- Facilities Environment
- Facilities Energy
- Vehicle Pass-by Noise
- Global Climate

### **Global Environmental Manufacturing Support Organization**

The Energy and Environmental Strategy Board (EESB), discussed above, guides our approach to environmental issues from a strategic and governance perspective. Working alongside the EESB is the Worldwide Facilities Group, which manages the operational aspects of our manufacturing functions around the world. The Environmental Services and Utilities Services Groups of the Worldwide Facilities team are specifically responsible for our operational environmental issues. A general view of our environmental management is that the EESB sets our environmental strategy and the Worldwide Facilities Group puts the strategy into practice at our sites around the world.

There are a number of other teams involved in our global environmental management. Under the coordination of the Worldwide Facilities Environmental Services Group are the Global Environmental Issues Team (GEIT), which aims to implement common environmental policy for our operations around the Globe, and the Supplier Environmental Advisory Team, which works with suppliers to improve environmental performance. The Global Energy Team is coordinated by the Worldwide Facilities Utilities Services Group, which is responsible for utility management around the world. The Global Energy Team concentrates on energy purchase conversion and use and is currently implementing an Internet based solution for worldwide utilities data. As a general rule the EESB sanctions the work of these teams and they are coordinated by the Worldwide Facilities Group.

The majority (79%) of our manufacturing and manufacturing support operations are located in North America. GM Europe operations make up roughly another 11% and South America, 6% of operations. For this reason the teams responsible for environmental management outlined above operate out of North America.

### **GMNA Environmental Manufacturing Support Organization**

Since 1995, our North American operations consolidated management for Environmental Services into a single unit. All environmental professionals report to the unit, which provides a variety of services to our manufacturing and non-manufacturing facilities. By creating a single unit, we have been able to share the best lessons learned from across our North American region. Regional personnel and leadership personnel meet regularly to solve common problems and share lessons learned.

Management of manufacturing facilities is divided into regions as follows:

- Eastern Region
- Southern Region
- Ohio Region
- Midwest Region
- S. E. Michigan Region
- Mid-Michigan Region
- Canada Region
- Mexico Region

The overall organizational structure has provided us with a greater degree of flexibility, allowing the sharing of expertise across different facilities within each region. Regional groups are supported by a headquarters environmental activity located in Troy, Michigan, responsible for Chemical Risk Management/Industrial Hygiene, Environmental Permitting and Operations Support, Remediation and Plant Decommissioning, and Regulatory and Legislative Interface. This single organizational structure has allowed us to effectively implement our environmental programs across all activities. For example:

- Chemicals Management Program.
- Resource Management (RM).
- Voluntary Pollution Prevention Programs. As a corporation, we participate in:
  - U.S. EPA WasteWise Program
  - Michigan Auto Partnership
  - Canadian Automotive Manufacturing Pollution Prevention Project - Refer to [www.cvma.ca/Industry.html](http://www.cvma.ca/Industry.html) under Publications for the latest Pollution Prevention Progress Report
  - Voluntary Challenge & Registry for Climate Change in Canada

In addition to these programs, many of our plants and facilities around the world have individually committed to participation in various other local or regionally based voluntary programs.

- Conserve Resources/Prevent Pollution (WE CARE) Strategy. This initiative is a process to look at environmental and energy conservation based on the hierarchy of prevention, reduction, and recycling, in that order. The strategy is a joint activity in the U.S. with the United Auto Workers. Training materials developed with the United Auto Workers for manufacturing and office operations and for product design engineers are utilized to inform all employees about their role in conservation activities. The training materials are available to our facilities worldwide in English and Spanish. To share successes between facilities, case studies are developed and distributed through an internal web site. An awards program is also available to facilities in North America.
- Third Party Data Management & Regulatory Reporting. We have engaged the services of a third party to standardize environmental data collection from our facilities. This common format helps to ensure consistency and accuracy in environmental reporting. With over 30 regulatory reports required per facility, it is imperative that data is highly accurate. This system reduces the burden on the environmental professional, allowing her/him to spend more time on the facility floor working on pollution prevention and compliance activities.

- Remediation and Plant Decommissioning Activities. For several years we have had single point responsibility for all remediation activities. During 2001, responsibilities for all plant decommissioning activities were also integrated into this group. This single point accountability allows for uniform implementation of environmental clean-up requirements, and timely and efficient demolition of antiquated facilities, with a focus on recycling of materials and redevelopment of property.
- Design for the Environment Facilities Team. Established in 1999, the Design for the Environment (DfE) Facilities Team is part of the Worldwide Facilities Group, Environmental Services group. Team members are responsible for interfacing with other DfE Teams worldwide. The DfE Facilities Team provides the environmental expertise to develop management systems that integrate life cycle analysis and environmental considerations into manufacturing processes, product development, research and development, and material selection activities. The DfE Facilities Team works with manufacturing operations to improve existing processes, using new technologies or operations to prevent waste, and avoid air, water and environmental impacts before manufacturing processes are put in place. The outcome is a reduction in facility and product environmental impacts as well as reduction in process, product, and regulatory compliance costs.
- In August 2002, GM worked in concert with the New Jersey Department of Environmental Protection, U.S. EPA Region II, and the cities of Clark and Cranford, New Jersey, to convert a former industrial site into a prime recreational resource for the area. The redevelopment consisted of a nine-hole public golf course, a full service clubhouse, a 40-station driving range and an 18-hole miniature golf course. This is an example of how General Motors recognizes our responsibility to communities we have been involved in and works to ensure sustainability.

### **Global Environmental Issues Team**

By combining representatives from operations across the globe, the goal of our Global Environmental Issues Team (GEIT) is to develop and implement a common environmental policy for our facilities globally. The GM Environmental Principles serve as the basis for this activity. Meetings are scheduled annually, but issues-based working groups hold additional teleconferences or meetings throughout the year.

The GEIT draws upon the best ideas and talents of employees from around the globe and helps us to function as an integrated organization. The GEIT is composed of representatives from our operations in North America, Europe, Asia-Pacific, and Latin America, Africa and the Middle East. The global makeup of the GEIT is intended to ensure that there is proper detection, consideration and resolution of common environmental concerns.

The group considers many facility environmental issues affecting global operations and helps to spread best practice between facilities. These include developing a set of global metrics for measuring environmental performance and the implementation of independently certified Environmental Management Systems at all of our facilities.

**Global Energy Team**

Our Global Energy Team, which is coordinated by the World Facilities Utilities Services Group and comprised of representatives from each of our business regions, meets on a quarterly basis to discuss and share energy practices. The team also held its first face-to-face meeting in April 2002. The objectives of the team are to establish common goals, monitor progress and share best practice across our global operations.

During 2001, the team established a corporate goal of 10% energy reduction globally by 2005 from a 2000 baseline. To help manage energy globally, a common utility information system has been developed. It is currently being used to track GMNA utility information and will be tracking all global utility information - starting in 2003.

Energy efficiency is an essential element of our energy strategy. The Utilities Services Group integrates procurement, operation of utility systems and plant level energy efficiency through a single organization. Common initiatives have been developed to improve equipment shutdown and efficiencies, integrate the latest efficient technologies and monitor and control utility usage.

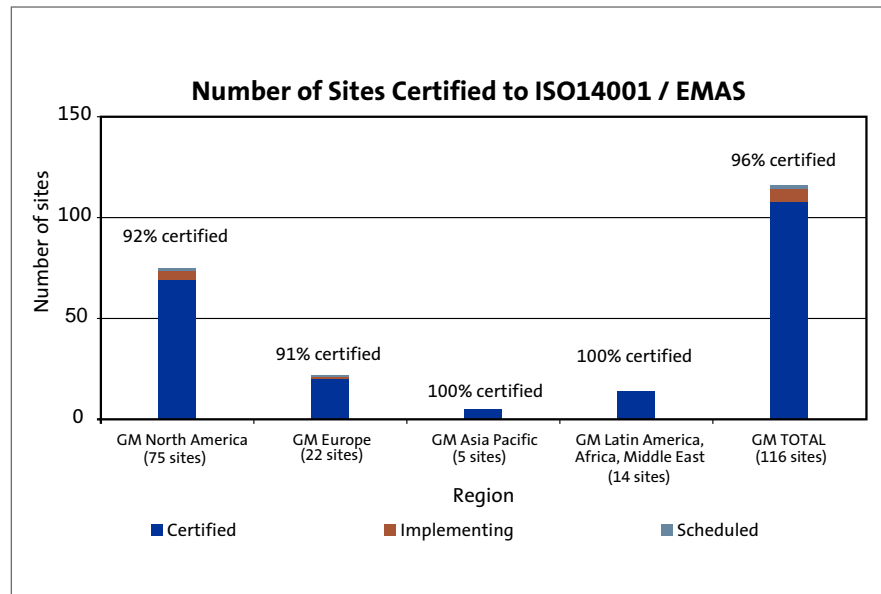
## ENVIRONMENT &amp; ENERGY INFORMATION

*Management:*

## Management systems

Building on our existing environmental management framework, we have redesigned our global environmental management system (EMS) model around ISO 14001 and have made several enhancements in doing so. Although ISO14001-based, our EMS includes several additional requirements that place increased emphasis on supporting environmental performance and cost reduction activities.

These elements provide our global facilities a common framework and specifications to help understand how their activities interact with the environment and to ultimately improve management of these activities in an ongoing cycle.



## ENVIRONMENT &amp; ENERGY INFORMATION

*Management:*

## Measuring Performance

In an effort to assess the environmental performance of our worldwide operations and to better manage environmental issues, our Global Environmental Metrics Team, comprising employees from operating units around the world, and the Global Environmental Issues Team (GEIT), agreed upon a common set of metrics for our facilities in September 1999.

2001 marks our third year of worldwide energy and environmental data collection and we are publishing our global performance data (1999-2001) against four of the metrics in this report. These are energy use, water use, carbon dioxide emissions and recycled and non-recycled waste. The publication of this data is part of our commitment to transparency and accountability.

This is a global process involving over one hundred facilities operating in different cultural and regulatory environments. We are working to improve the consistency of data from all plants and to improve the data collection and maintenance process. Regional differences in definitions, terminology, and calculation methods pose challenges. However, we strive to ensure the accuracy of the reported data and we will continue to refine the data management processes in order to provide further quality assurance.

**GM Global Environmental Metrics**

## Inputs:

## Energy

- \* Fuel use — natural gas, oil, coke, propane, etc.
- \* Electricity use
- \* Other energy purchased

## Water

- \* Purchased water
- \* Groundwater from on-site wells
- \* Surface waters from rivers, lakes, streams, etc.



Outputs:

Air

- \* Nitrogen Oxides — from fuels used
- \* Sulphur Oxides — from fuels used
- \* Carbon monoxide — from fuels used
- \* Volatile Organic Compounds (VOCs) — from assembly plant paint shops

Waste Water

- \* Wastewater discharges to treatment (excluding storm water) — sanitary and industrial volumes
- \* Wastewater discharges direct to surface waters (excluding storm water) — sanitary and industrial volumes
- \* Heavy metal content

Hazardous Waste

- \* Recycled and non-recycled

Non-Hazardous Waste

- \* Recycled/reused and non-recycled

Greenhouse Gases

- \* Carbon dioxide from energy use including the indirect effect of our electricity use

## ENVIRONMENT &amp; ENERGY INFORMATION

*Management:*

## Management: Compliance

Statutory, regulatory, and permit programs administered by various government agencies impose numerous substantive and procedural requirements on our manufacturing facilities and vehicles. For example, a typical assembly plant in Michigan is subject to more than 850 environmental legal requirements. Given these extensive requirements, it is not unusual for compliance issues to arise through allegations by government agencies or by private parties, as well as through matters identified by our own audit programs.

In the U.S., the automobile and truck manufacturing industry is one of many industries that federal, state, and local authorities regulate through environmental requirements. Government agencies or private parties can, on occasion, challenge our compliance with numerous environmental requirements. Each instance of alleged non-compliance is treated seriously. These actions are often settled, even though we may not agree that a violation has occurred. In these situations, we do not admit liability, but settle the matter if we determine it is preferable to litigation. Administrative and judicial matters resulting in the payment of a fine or penalty greater than \$25,000 in 2001 are reported in the table below.

STATUTE	No. of Resolved Matters	Total Value of Penalties/Fines Paid*
Clean Air Act (CAA)	3	\$281,573
Clean Water Act (CWA)	0	-
Resource Conservation and Recovery Act (RCRA)	0	-
Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (other than Superfund)	0	-
Superfund Amendments and Reauthorization Act (SARA)	0	-
Toxic Substance Control Act (TSCA)	0	-
Atomic Energy Act (AEA)	0	-
Occupational Safety and Health Act (OSHA) Hazardous Material Transportation	0	-
TOTAL	3	\$281,573
* Penalties or fines paid may be for matters commenced in prior year(s). These figures include payment of penalties/fines for actions under corresponding state statutes.		

Outside the U.S., we use a variety of tools to manage compliance, including an expansion of our environmental audit program globally and implementation of environmental management systems (e.g., ISO 14001 and EMAS). In addition to our environmental principles, we have also developed global environmental performance criteria designed to safeguard human health and the environment, which apply where local regulations do not exist or are less stringent than GM requirements. In addition, we have a global stationary source environmental issues team to share knowledge from our facilities around the world and implement global programs.

#### Accidental Releases

We track oil and chemical spills and non-routine air emissions above reportable quantities. The table below shows spills and non-routine air emissions above Federal reportable quantities for U.S. and Canadian plants, as defined by the Environmental Planning and Community Right to Know (EPCRA) and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). Reportable releases from these facilities have steadily declined over the last three years.

Year	Land/Water	Air	Total
1999	2	3	5
2000	0	1	1
2001	0	0	0

## ENVIRONMENT &amp; ENERGY INFORMATION

*Management:*

## Supply chain management

**Supplier Environmental Management Standards**

In July 1998, we advised our top 600 vehicle parts suppliers (based on sales volume) that we required them to become certified to an Environmental Management System equivalent to ISO14001 by the end of 2002. This requirement applies to all supplier facilities that provide parts to GM and that have a significant environmental impact and to suppliers whose current or future contracts extend, or might extend, beyond 2002.

**GM Supplier Environmental Advisory Team**

In 1998 our Supplier Council formed a Supplier Environmental Advisory (SEA) Team. This team, which is made up of nine suppliers and representatives from Worldwide Purchasing, Research and Development, Engineering, Worldwide Facilities — Environmental Services and Public Policy, meets throughout the year to develop joint efforts to improve environmental performance.

The SEA team covers a number of pertinent topics, for example:

- ISO 14001 certification requirements for product suppliers.
- Evolution of the Greening the Supply Chain pilot project initiated at Saturn and expansion to other GM suppliers.
- Development of the Environmental Statement of Requirements (ESOR) used during the quoting and purchasing process. This guidance document informs suppliers of our environmental requirements as they pertain to the sourcing of parts for our vehicles. The ESOR is available to suppliers through the GMSupplyPower website.
- The GMability.com web site, where information is available regarding environmental activities.
- The European Union End-of-Life Vehicle (ELV) directive that will have an impact on the global automotive industry.
- The Global Reporting Initiative (GRI), which we view as a business management tool, allowing us to evaluate our past and current performance and gain a better understanding of how to set future goals and dedicate resources for improvement.

**Supply Chain Management at Opel and Vauxhall**

"Creativity" teams of buyers, representatives from the European plants and engineers from the International Technical Development Center (ITDC), decide which suppliers the company will work with. Opel, for example, requires that candidate supplier companies comply with the QS9000 quality standard and informs suppliers of environmental guidelines when seeking quotes. Since 1998, teams of experts from Opel and eight supplier companies have met to analyze supplier relationships, and how to improve cooperation with partners on environmental issues, with respect to production and manufacturing.

## PAPERLESS PURCHASING PROCESS

During 2001, GM Worldwide Purchasing (WWP) developed a completely electronic Request for Quote (RFQ) process between WWP and the supplier community. The project was originally focused on improving the part purchasing experience for both the supplier and GM; however, it has become an example of how efficient business practices can reduce our environmental impacts. The former process involved copying, addressing and sending the required documents to the suppliers by mail. The RFQ contains standard documents required for each and every quote, which amounted to approximately one-quarter inch of paper. In addition, the Engineering Statement of Requirement (SOR) that accompanies the RFQ is anywhere from one-quarter inch to 5 inches of paper.

The new process allows suppliers to access the required documents from the GMSupplyPower and Covisint web sites. This allows them to edit and submit their information electronically as well as disseminate relevant information among their own team members, avoiding copying and distributing the mail. The paper saved in the U.S. alone is in excess of 2 tons per year. Every ton of paper saved avoids the use of:

- \* 17 trees,
- \* 7,000 gallons of water,
- \* 4,200 Kilowatt hours of energy,
- \* 410 gallons of fuel,
- \* and 3 cubic yards of landfill space.

According to the U.S. EPA's WARM (Waste Reduction Model) calculations, by reducing office paper use by 2 tons, we saved the equivalent energy of removing one passenger car from the roadway or:

- \* 11 barrels of oil,
- \* 505 gallons of gasoline,
- \* and 6 metric tons of CO<sub>2</sub> equivalent greenhouse gas emissions.

### \* *Standardized Environmental Management*

In addition to other initiatives, the team has expanded the guidance for Opel's materials and components suppliers on preparing their environmental management system (EMS). Opel and Vauxhall require Europe-based suppliers to obtain certification to either ISO14001 or the EU Eco-Management and Audit Scheme (EMAS), or submit a relevant company self-declaration, by December 31, 2002. An adequate environmental management system should cover all company facilities that cause significant environmental impact, including production equipment, manufacturing processes and other activities. The benefit of an efficient EMS is the reduction in environmental expenses and enhanced ecological performance.

### \* *Close Cooperation Starts Early On*

As customer expectations and legal requirements for Opel's models become increasingly demanding, Opel must rely on its suppliers to provide top quality parts. It is crucial, therefore, that suppliers have in-depth technological expertise. Indeed, because of their expertise, Opel's partners often make valuable contributions at very early stages of development of a vehicle.

This is the case, for instance, where Opel needs to hasten the introduction of new materials in series production. In their endeavors to close material cycles by releasing recycled materials for use in new vehicles, Opel engineers go to supplier sites to get a realistic idea of sample material or component production. Among others items, they verify compliance with specified assembly times and make sure that fluctuations in recycled material batches are minimized. It is frequently the suppliers themselves who suggest materials for recyclability testing. Opel acknowledges its suppliers' contributions at its annual "Supplier of The Year" event.

\* *Uniform Material Data Sheet*

To reduce the use of hazardous materials and meet future recycling quotas, detailed information on the materials that suppliers use in the parts and components they supply is essential. In the future, this information will be harmonized and made available to the entire automotive industry in the form of a Material Data Sheet (MDS). Because they are sent over the Internet, all material data sheets are quickly and directly incorporated into its common database system. Suppliers were trained in the use of this German-wide system before its official launch in summer 2000. A global expansion of the system is also planned.

#### SUPPORTING SMALLER SUPPLIERS AT VAUXHALL

Vauxhall recognizes that achieving ISO14001 can be more of a challenge for smaller companies. In order to assist small-to-medium sized enterprises (SMEs), Vauxhall is supporting a DTI-sponsored program called Project Acorn. Operated by the British Standards Institute (BSI), the scheme provides training and partial funding to SMEs wishing to implement an environmental management system.

The scheme has two levels, fast-track and non-fast track. Vauxhall intends that fast-track suppliers achieve an EMS, equivalent to that required by ISO14001, within one year. This is achieved through training classes that are offered in "manageable steps." Non-fast track aims to achieve this level within two years, for a reduced fee.

Currently, Vauxhall has nominated 25 companies, who expressed interest in the scheme, with five of those currently signed up for the fast track plan. This will help achieve its objective of ensuring all suppliers have a certified EMS in place by the end of 2003.

## ENVIRONMENT &amp; ENERGY INFORMATION

*Management:***Employee training & Support**

Environmental management requires a well-trained workforce not only to keep pace with a changing regulatory landscape but also to satisfy our goal to have the best-trained environmental engineers in the world. To this end, we have set a goal of having each of our U.S. environmental engineers achieve and maintain Certified Hazardous Materials Manager (CHMM) certification. This sets the knowledge base upon which our environmental engineers can build. To date, 90% of our engineers have achieved the CHMM certification. We have set up similar certification programs in Canada, Mexico, South America and China and have also developed a core curriculum of environmental courses for our engineers.

In Europe, environmental training has been developed for engineers at the International Technical Development Center (ITDC) in Rüsselsheim, Germany. This program focuses on design for manufacturability and design for environment (DfE) where environmental concerns are accounted for early in the product development process.

**Co-Op/Intern Program**

Our cooperative and internship program seeks to provide a professional environmental engineering resource at our facilities. Students are given hands-on training within various types of operations, including assembly, foundry, metal stamping and machining operations. Upon graduation, these students are able to accept an assignment without disruption of environmental service at a facility.

Currently, five co-op students and four interns are in the program in North America. Since its inception in 1994, we have employed 23 program graduates as permanent environmental engineers.

**Employee Communications**

A variety of methods are utilized to transmit information and data between our environmental and energy professionals. An Internal Communications Strategy team oversees the format and flow of information and evaluates the effectiveness of communication methods, which include satellite broadcasts, newsletters, networking meetings and meetings with management. Employees have access to at least one of these communication channels each month.

An extensive Worldwide Facilities Group web site is maintained by a number of "web authors." Its purpose is to keep employees informed about the group's business activities and the resources available from other centers of expertise within the Corporation. The Environmental Services section of the web site covers many topic areas including news, events and site information. Information regarding our facilities' ISO 14001 certification processes and associated lessons learned are posted on the site. Business plan information and updates on the progress of strategic business initiatives are also available.

ENVIRONMENT & ENERGY INFORMATION

## Management:

### Awards & accomplishments

#### GMNA

2002 GM Orion Assembly facility, Michigan Clean Corporate Citizen

2002 National Pollution Prevention Roundtable, Most Valuable Pollution Prevention (MVP2) award (Saturn Corporation)

2002 U.S. Environmental Protection Agency, WasteWise Program Champion in the Very Large Business category (GM U.S. operations)

2002 Tennessee Department of Environment and Conservation, Saturn Corporation recognized as the first industry in Tennessee to meet all criteria as a "Performer" in the Tennessee Pollution Prevention Partnership (TP3)

2002 GM Powertrain Livonia Engine facility and Pontiac Centerpoint Campus Validation Center, Michigan Clean Corporate Citizen

2002 Society of Automotive Engineers (SAE), Environmental Excellence in Transportation award, Materials Development and Usage category for "Environmental Health & Safety Engineering Support for Acoustical and Structural Vehicle Material Usage"

2001 Stockholm Industry Water Award (Ramos Arizpe, Mexico facility)

2001 Seal of Sustainability, Sustainable Business Institute

2001 Environmental Excellence Award, bridging the Gap (Kansas City facility)

2001 U.S. Environmental Protection Agency, WasteWise Partner of the Year Award in the Very Large Business category (GM U.S. operations)

Environmental Regional Award, Environmental Regional Commission, Region of Tarapacá, Chile, General Motors Chile S.A., Arica Plant

2000 Environmental Stewardship Award, National Indian Business Association

Global Green USA 2000 Millennium Award: Global Green USA, the American affiliate of Green Cross International

2000 Bowling GREEN Award, Bowling Green, Kentucky and Operation P.R.I.D.E. (Bowling Green Assembly, Kentucky facility)

2000 GM Powertrain Warren Transmission facility, Michigan Clean Corporate Citizen

Project of the Year Award, U.S. EPA Landfill Methane Outreach Program (Orion, Michigan, facility)



Michigan Power Booster (Orion, Michigan facility and GM World headquarters at the Renaissance Center, Detroit, Michigan)

Pretreatment Excellence Award: State of Texas (Arlington Assembly facility)

2000 Fred Schmitt Award for Outstanding Corporate Leadership, the National Recycling Coalition

Eighth Annual Governor's Pollution Prevention Awards, 2001 Award for Management Systems, State of Missouri (Wentzville, Missouri facility)

Award of Achievement for EarthForce/GM partnership, National Resources Council of America

U.S. Environmental Protection Agency Achievement Award for GM's support for RCRA cleanup reforms, brownfield redevelopment, and for GM's Truck Product Center in Pontiac, Michigan becoming the 500th facility to attain both Corrective Action Environmental Indicators.

#### **GME**

*Vauxhall Motors Ltd*

Green Apple Awards 2001 - Luton Plant, National Gold Winner

Green Apple awards 2001 - Ellesmere Port Plant, National runner-up for best practice amongst motor manufacturers

Annual Environmental Award, 2000, Auto Trade Magazine

National Champion in the heavy engineering section of the Green Apple Environmental Best Practice Award, 2000

Hooton House at Ellesmere Port, "Quality in Construction", 2000, Construction News, UK

Finalists in the Motor Trader 2000 Environmental Awards, Motor Trader, UK

Finalists in the Motor Trader 2001 Environmental Awards, Motor Trader, UK  
Luton Plant was recognized in 2001 for implementing outstanding water management practices to reduce usage and minimize impact of effluent on receiving bodies of water

*Opel*

Opel Hungary Szentgotthard Plant

EFQM Finalist, 2000, European Foundation for Quality Management

Opel Portugal

Best Environmental Report Award, 2000, Portuguese Association of Accountants Officials

Adam Opel AG

Energy and Environmental Award, Driver Protection Automotive Association

#### **GMAP**

Opel / GM Taiwan

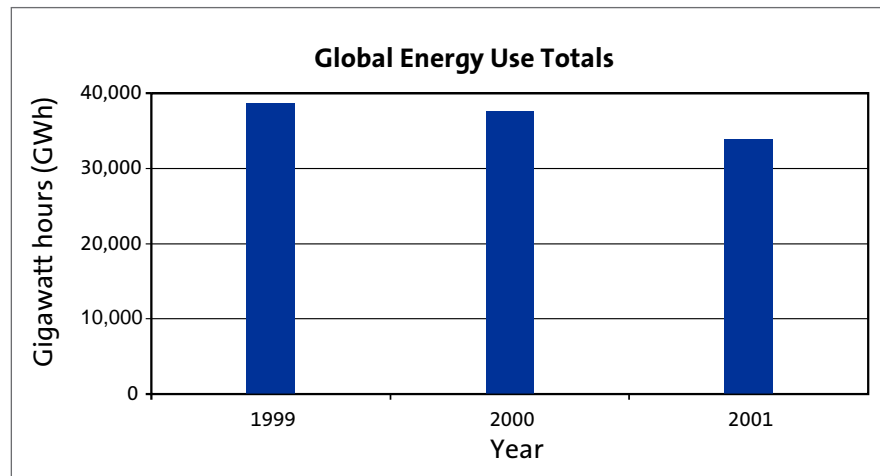
Cyber Oscar Award, 2000, Taiwan

## ENVIRONMENT &amp; ENERGY INFORMATION

*Energy use:***GM Global  
Energy Use**

Our global operations are focused on using energy in the most efficient manner possible. In 2001 our global operations consumed 33.9 thousand gigawatt hours (GWh) of energy from various sources including electricity, a 9.9% reduction from

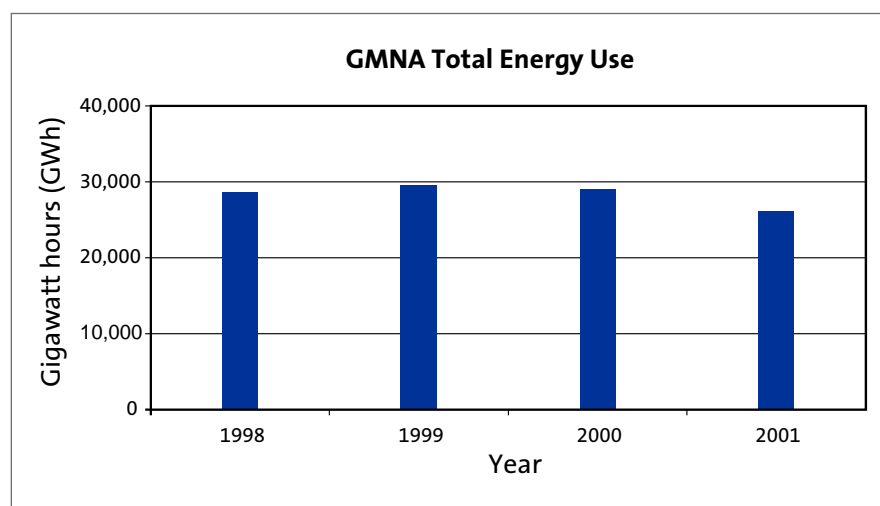
2000. Following this downward trend, the energy used per vehicle produced decreased by 2.0% to 4.36 megawatt hours (MWh) per vehicle.

**GMNA Energy Use**

We continue to work toward our goal of reducing energy consumption by 25% by 2005 from a 1995 base. This goal is being achieved during a period where our floor space has increased and process environmental controls are becoming more energy intensive. By the end of 2001 we had achieved a 17.9% reduction since 1995 and are continuing to make steady progress.

During 2001, GMNA energy usage decreased by 9.6% compared to 2000. Energy usage per vehicle rose by 1.7% from 2000 to 17.94 MMBtu (5.25 MWh) per vehicle produced, due to vehicle production decreases.

[Click here for Energy Efficiency Progress and Voluntary Energy Programs in GMNA](#)

**GM Canada**

Since 1990 our Canadian operations have reduced energy usage by over 46%. Energy usage decreased 11.4% in 2001 compared to 2000. GM of Canada publishes detailed energy efficiency accomplishments annually in the Voluntary Challenge and Registry Inc. (VCR) Program and has been recognized as Gold Champion level reporter by VCR.

#### GM Mexico

Our Mexican operations continued to reduce energy usage in 2001, achieving a 5.4% reduction compared to 2000. This was the result of many energy reduction initiatives such as the lowering of compressed air pressure on weekends at Silao, the elimination of one air compressor at Ramos Arizpe and a paint shop shutdown program at Silao.

#### GM Europe

In 2001, GM Europe initiated several activities to reduce energy usage in its facilities. These included engaging employees in shutting down equipment during non production periods; changing temperature and humidity setpoints in paint shop spray booths; reducing lighting levels and replacing energy inefficient light fixtures; reducing ventilation during non-production periods; and lowering the compressed air pressure during non-production periods. Together these activities achieved over \$2 million in savings, all without requiring any major expenditures.

#### GM LAAM

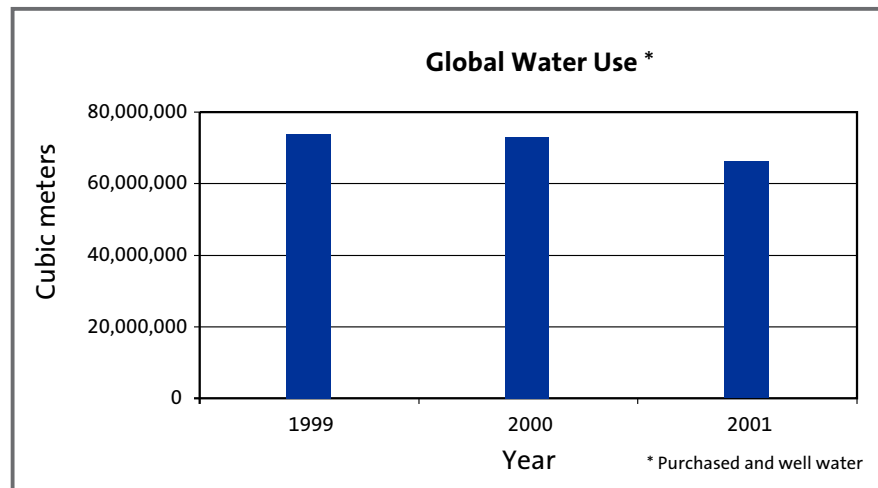
In Brazil, the worst drought in 70 years caused the government to ration electricity from June 2001 through February 2002. This is due to Brazil's reliance on hydro-electric power, supplying over 90% of their total electric demand. The government set as a target a reduction of 15% from peak demands. GM Brazil responded to this crisis by reducing lighting levels, shifting production schedules, shutting down equipment on non-production hours, and outsourcing some metal melting operations to suppliers using gas instead of electricity. The results of the efforts were a 22% reduction in electrical usage and a savings of over \$1.9 million. Even though the rationing has ended, GM Brazil plans to continue many of the initiatives to sustain a 15% reduction from 2000 levels.

## ENVIRONMENT &amp; ENERGY INFORMATION

*Water use:***GM Global Water Use**

Our worldwide manufacturing and support operations use water from many sources. In 2001 our global operations purchased and used 66.2 million cubic meters (17.5 billion gallons) of water, down 9.5% from 73.2 million cubic meters (19.3 billion gallons) in 2000.

Water use per vehicle also declined 1.7% to 8.72 cubic meters per vehicle built compared to 8.87 in 2000.

**Water Sources**

In the U.S., our water sources are primarily lakes, rivers, and tributaries. Well-derived water is a minor source of water. In Mexico and in other parts of the world, well water is the primary source and is highly valued as a scarce commodity. This emphasis is reflected by water reduction efforts at our Ramos Arizpe and Silao, plants in Mexico, where water use per vehicle is nearly less than half that of the U.S. benchmark. Our sustainability goals drive our efforts to minimize the impact of our water usage on the communities where our operations are located.

**Water and Waste Water Management****GMNA**

We consider water to be a scarce resource and for this reason we have continued to focus on water conservation initiatives. Within GMNA, our goal is to reduce water usage by 30% by the end of the 2002 from a 1995 base line. This goal was revised in 2000 from a 20% reduction goal, and we are close to achieving the revised target. Water usage for 2001 was 45.5 million cubic meters (12.0 billion gallons), which represents a 29.2% reduction from the 1995 base. In comparison with 2000, our water use was reduced by 13.2%. Our North American plants also decreased water usage on a per vehicle basis by 2.3% in 2001 to 9.1 cubic meters (2,402 gallons) compared to 2000.

In all of our plants wastewater is treated before being discharged to municipal treatment plants or other receiving bodies of water, meeting all applicable regulations. Where there is no clear discharge criterion, we apply our own minimum guidelines as defined by our Environmental Performance Criteria.

Some examples of water conservation initiatives are listed below:

- \* Improvements have been made to the instrumentation and controls for 18 cooling towers at our Willow Run, Michigan Transmission Plant. These changes will result in water savings of about 0.9 million cubic meters (239 million gallons (0.9 million cubic meters) per year in 2002. Additional changes, which are underway, will bring the total savings to 1.25 million cubic meters (329 million gallons) per year.
- \* Our GM de Mexico plant in Silao has continued to reduce its water usage. In 2001, the water usage dropped to less than 2 cubic meters per vehicle. This is the result of activities such as reduced water use in the paint shop water use reduction and feeding cooling towers with recycled water. The water use at Silao has dropped over 50% since operations at the complex began.
- \* Our GM de Mexico Ramos Arizpe Complex was awarded the Stockholm Industry Water Award for 2001 for outstanding achievements in water use reduction. The plant has commissioned a state-of-the-art water recycle/reuse system and has continued to focus on water conservation initiatives. The Ramos Arizpe facility has reduced well water withdrawal by 50% since 1986 while producing seven times more cars and 50% more engines.
- \* GM of Canada implemented many water-saving projects, saving 454 million gallons (1.7 million cubic meters) in 2001. This is a 25.1% decrease from 2000 levels.

Our Swedish subsidiary Saab extracts, uses and returns water for its manufacturing processes from the nearby river, the Göta Älv. In terms of volume the Göta Älv is Sweden's largest river, with a mean flow of 550 cubic meters per second. It takes in water from a drainage basin equal to one-tenth of Sweden's total area. The river is a vital natural resource, supplying drinking water to more than 700,000 people. The Göta Älv is also of great recreational and biodiversity value, providing a home to almost every species of fish present in the various lakes and streams of Sweden. Maintaining water quality is therefore one of Saab's highest priorities.

## ENVIRONMENT &amp; ENERGY INFORMATION

*Resource use:*

## Health and Environmental Impact Assessments

The materials recommended for use in our products and manufacturing processes are assessed for potential health and environmental impacts prior to approval using several complementary processes. Materials are assessed according to the Productive Materials Review Process (PMRV), which supports the release and material engineering community, and is part of the Design for the Environment (DfE) process. If a material is approved, the information is then sent to the plant Hazardous Materials Control Committee (HMCC), for local review and implementation. The HMCC assesses potential health and environmental impacts of those materials that support the manufacturing process (indirect materials), but do not actually become part of our products.

The PMRV team continues to provide critical support during assessment of the materials proposed for use at our facilities. Timely review and communication to design and release engineers and local HMCCs assist our plants in meeting start-up deadlines and material needs. For example, sealant assessments at Flint Truck resulted in significant improvement of sealer performance while reducing potential health and environmental concerns. The timeliness of these reviews ensures a smooth transition for all new production systems. Manufacturing Planning Studies and DfE Assessments take a proactive look at our processes and materials in conjunction with the PMRV process. These early assessments analyze processes planned for use in our facilities, incorporating the DfE principles of prevent, reduce and recycle. The process considers a wide variety of items ranging from how the material is brought into the facility, stored and transported, to correct ventilation, and recycling of any waste that may be created.

## Chemicals Management

We continue to expand the Chemicals Management programs in our facilities to include all indirect chemicals used in the manufacturing process (those that are not directly involved in producing a vehicle). Chemicals Management utilizes a single supplier to provide non-product-related chemicals at each GM facility. Chemicals Management activities include chemical process control, process improvements, chemical reuse, chemical recycling, and health and safety improvement. The Chemicals Management supplier also provides the chemical data required for regulatory reporting.

When chemicals management programs are installed in a plant, first-year material savings average 20%, with additional savings of 3% to 5% in the second and third years. Materials savings result from material conservation, material standardization, and process optimization. Additional benefits include improvements in quality, throughput, and manufacturing efficiency.

All Chemicals Management programs are now being requoted to a new specification, which will standardize program scopes and administrative procedures. The new program enhancements will further support the implementation of strategic environmental and manufacturing initiatives.

## Use of packaging materials

### GMNA

In the last decade, our vehicle assembly plants have taken aggressive steps to reduce volumes of packaging from parts and components disposed to landfill. The GMNA Containerization Group has been instrumental in making the changes.

An Environmental Packaging Specification that was initiated in the early 1990s has been incorporated into our general packaging specifications and remains in effect. The various marking, construction and material characteristics stated in the specification ensure that waste packaging can be readily broken down and recycled. In 1994, we started cutting down expendable packaging waste by converting to reusable containers. The decision to use a reusable container for a particular application is based on cost considerations as well as considerations of supplier proximity and protection of the parts being shipped. Reusable containers make up about 60% of our assembly plant packaging.

In 2001, the GM Energy & Environmental Strategy Board (EESB), approved the use of common plastic materials for protective shipping caps and plugs in all facilities. This effort will promote reuse, increase recycling, minimize costs and reduce landfill materials.

North American Containerization Engineers work hard to reduce, reuse, and recycle packaging. For instance, they work closely with the Materials Engineering group and use their GM Preferred Material list as a starting point for dunnage (packaging) material selection. This minimizes the complexity of materials that will eventually need to be recycled. An internal guidance document called "Lesson Learned" was recently published on plastics design, tooling, manufacturing and material selection. All of these areas must be reviewed for potential impacts before a packaging material is selected for use. Environmental impact is one of the steps considered in the selection process.

In Europe, GME was the first auto manufacturer to adopt reusable packaging for its material transportation systems. As a result, the use of environment-friendly reusable packaging has risen to 97%. Near-indestructible small part containers and special hanging racks designed by our engineers contribute to the low proportion of packaging waste. Approximately 70,000 small part containers are shipped to European plants each day.

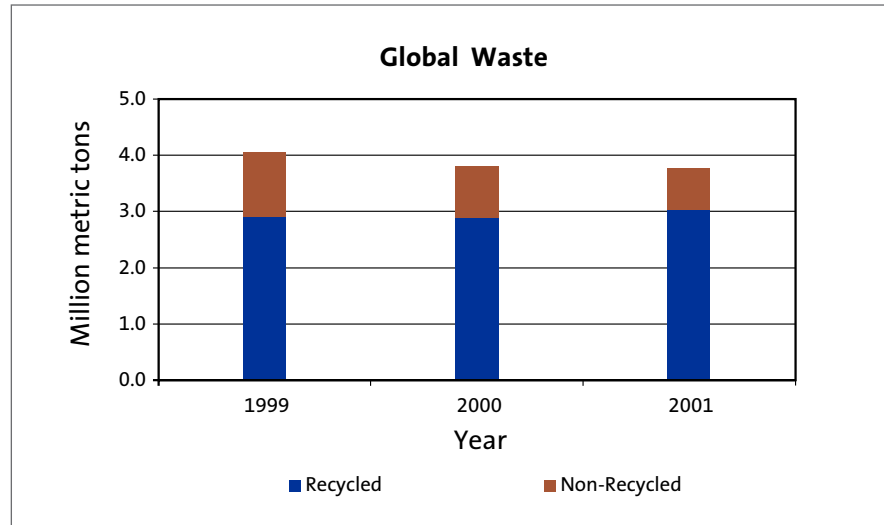
Recycled content is also important. Plastic pallets are made up of 50% recycled materials. Containers made of thermoplastic resin must comprise 25% recycled materials. The construction of containers is also well planned, so that they may be easily compacted to minimize the space they take up during return trips to the supplier.

## ENVIRONMENT &amp; ENERGY INFORMATION

*Waste & recycling:***Waste**

Globally, the total amount of waste managed by our 142 facilities declined 1.3% between 2000 and 2001 from 3.81 million metric tons to 3.76 million metric tons. Worldwide vehicle production was down 9.5% and production-adjusted waste volumes during the same period increased by 9% from 462 kg per vehicle to 504 kg

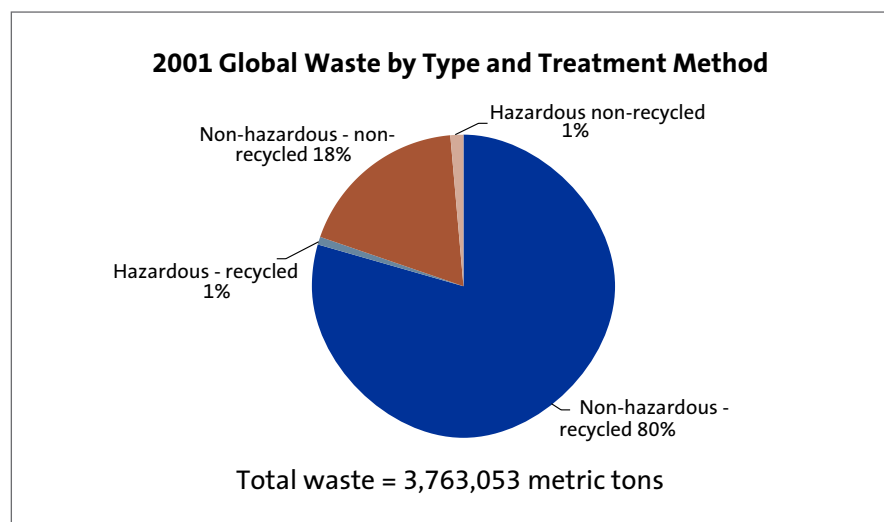
vehicle. Although production was down, a certain level of baseline operations exist that factor into ongoing waste levels. Many demolition and renovation projects are also underway that contribute non-traditional wastes to the total amount generated.



The chart below shows the total amount of waste and indicates that the volume of waste recycled was typically more than double the volume of non-recycled waste in 2001. Of the 142 GM facilities that report environmental metrics data, 101 are manufacturing sites and 41 are non-manufacturing locations and after-market parts distribution centers in the U.S. and Canada.

**GM Global Waste Goals**

In April 2002, the Global Environmental Issues Team (GEIT) set two stretch goals to reduce total waste (hazardous and non-hazardous) and increase recycling worldwide by 15%. The base year is 2000 and the target year is the end of 2005. Since 1997, facilities in GMNA surpassed their five-year goal one year early and reduced the volume of their non-recycled materials by 54% (adjusted for production, the reduction was 50%).





## Managing Global Waste Data

Waste data is currently tracked through the use of an annual report from our worldwide facilities. Other options for online reporting are being explored that will allow facilities to input their data as it becomes available.

Some operational changes, as well as refinements in data management, have occurred in the past year and these have changed the distribution of plants listed in our previous report as environmental metrics participants. For instance, data that is made available from joint venture facilities will be reported separately from GM facilities in the future.

The majority (79%) of our operations are located in North America. GM Europe operations make up another 11% and South America, 6% of operations. North American operations therefore produce the majority of GM waste volumes.

Waste reduction and increased recycling are business imperatives for us. Programs such as Resource Management, Chemicals Management, Oil Management, and ISO 14001 ensure that we will continue to focus on progressive improvements. We will also work with global teams such as the GEIT to ensure that facilities in each region can share and effectively use the best practices developed in our facilities around the world.

In 2000 we became the first auto manufacturer ever to receive the National Recycling Coalition's prestigious Fred Schmitt Award for Outstanding Corporate Leadership. The award was in recognition of our innovative Resource Management (RM) program. In March 2002, the U.S. EPA featured the program in an article entitled Creative Contracting at General Motors in their publication "WasteWise Update."

Some operational changes, as well as refinements in data management, have occurred in the past year and these have changed the distribution of plants listed in our previous report as environmental metrics participants. For instance, data that is made available from joint venture facilities will be reported separately from GM facilities in the future.

## Resource Management

Our Resource Management program preserves natural resources, reduces our environmental impact, and makes considerable cost savings. Under Resource Management, a single first-tier supplier manages all plant wastes. The supplier provides all resource management services through its on-site staff, and the supplier is economically compensated to reduce waste volumes.

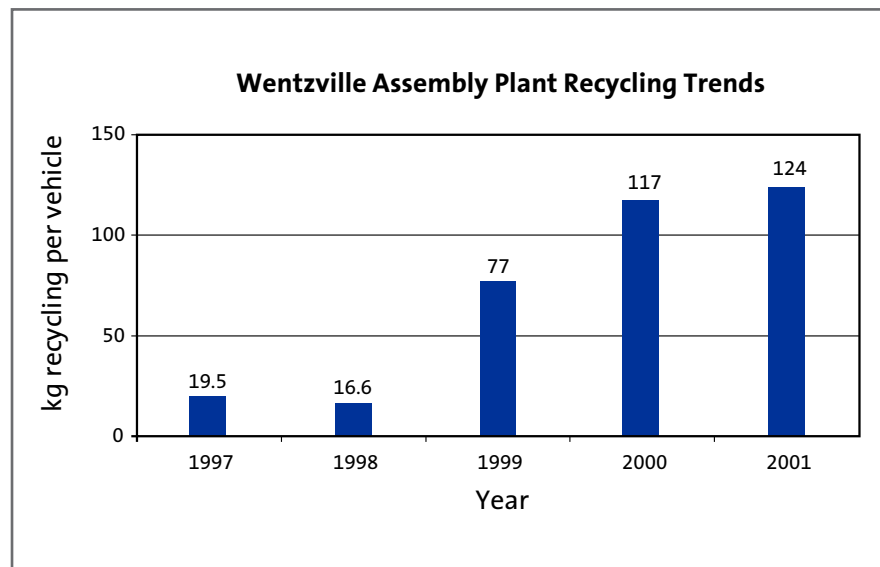
We have designed the program to eliminate waste before it happens. Resource managers are provided with financial incentives to find innovative ways to eliminate the waste created during the manufacturing process. Rather than paying a waste contractor to dispose of the material, our approach makes the supplier a partner inside the plant, searching for, and benefiting from waste reduction and recycling opportunities wherever they might occur. Cardboard boxes, wooden pallets and even cooking grease from cafeterias, items previously sent to landfill, are now turned into useful products. The benefits of the program were recognized by the U.S. Environmental Protection Agency at their WasteWise Awards and Recognition Ceremony, where it was suggested the program provided a national environmental model that should be embraced by other organizations.

The program is now operating in nearly all our GM North American facilities, where economically feasible. Our RM program has saved over \$8.4 million annually in North America. Although RM is not yet considered a global initiative, it has been implemented in six plants in Europe and is being reviewed by GM operations globally. Our current strategy is to consider the technical and economic potential of Resource Management in all new GM plants worldwide.

#### Resource Management

We piloted this program in 1994 at our engine plant in Kaiserslautern, Germany. After piloting the idea in Germany, we expanded Resource Management to five North American facilities between 1996 and 1998. After the success of these pilots, we continued its expansion in North America. For example, in the fall of 2000, we implemented the

program at GM Wentzville Assembly Plant, in Wentzville, Missouri. Since the inception of Resource Management at Wentzville, the plant's administration of waste and recycling services has been streamlined through the efforts of the Resource Manager. The program has resulted in significant cost and environmental improvements. Wentzville's managers credit the Resource Management program with successfully helping the plant decrease waste generated, improve recycling rates (see graph below), reduce overall waste management costs, and improve reporting, billing, and other related administrative tasks.



Further examples of innovative resource-saving initiatives include:

- \* Solvent-based parts washers have been replaced with aqueous-based parts washers. The substitution with aqueous-based washers minimizes the plant's VOC emissions and hazardous waste generation.
- \* Improvements to ensure proper waste handling in the plants, like segregation of non-hazardous and hazardous waste, and ensuring full waste drums before being shipped for disposal.
- \* Cafeteria grease is now being recycled to produce animal feed, instead of disposed of as solid waste.

## ENVIRONMENT &amp; ENERGY INFORMATION

*Waste & recycling:*

## Waste prevention

The activities described in this section result from actions taken by GM manufacturing and manufacturing support operations. Approximately 80% of these operations are based in North America and as a result, more information and case studies are available from the GM North America (GMNA) region.

## Industrial Oil Management

Three years ago we began to improve life cycle management of industrial oils in GMNA plants: this is now beginning to pay dividends. The program provides both substantial cost savings as well as significant benefits to the environment through waste prevention. The program functions on three levels:

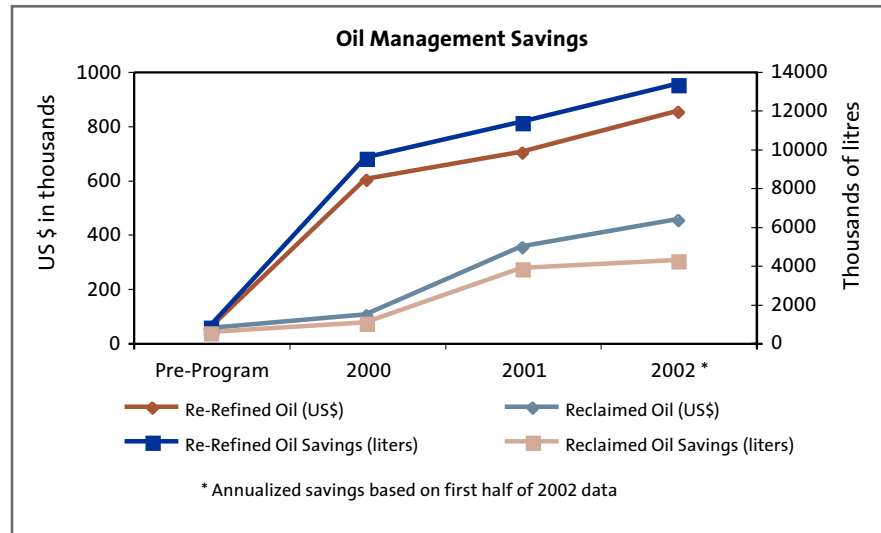
- \* First, plants switch from high volume lubricants to those approved against the GM "LS2" maintenance lubricant standards. The standard ensures high-quality lubricants and lubricant consolidation. Maintenance and problem resolution is also stressed throughout. These initiatives resulted in over \$2.7 million in savings in 2001.
- \* Second, plants recondition or recycle industrial oils using portable reconditioning units to remove water and particulates from oils even as the machines they service are still operating. Other plants collect the used oil for recycling off- or on-site. Annually this service saves our facilities \$1.8 million. A list of suppliers that can provide various on-site services is being compiled to assist plants with these initiatives.
- \* Finally, used oil is shipped off-site. It can be reclaimed or refined for resale to the plants where it is reused as metal removal fluid or as a maintenance lubricant. Nearly all of the 20 million gallons (76,000 cubic meters) of used oil that GMNA produces is collected in this program and is available for recycling. Although much of it still is sold for fuel, the volume of returned product is beginning to increase substantially, as shown in the chart below. This will continue to increase in future years as there is now a corporate mandate for increasing the use of recycled oil products in plants over the next three years.

The web page for oil management and Lubrication Standards can be found at <http://www.gmsupplypower.com> in the Manufacturing Power "Library".

## ENVIRONMENT &amp; ENERGY INFORMATION

*Waste & recycling:***GMNA Waste Prevention**

GM North American operations have a goal to reduce non-recycled non-product-output (or NPO) by 50% from a 1997 base year through year-end 2002. To help reach the goal, facilities utilize a combination of waste reduction and recycling techniques. By the end of 2001, we achieved a 54% reduction, hitting our target one year ahead of schedule.

**Recycling**

Recycling plays an important role in our ongoing efforts to reduce waste. Global facility waste recycling rates increased between 2000 and 2001, rising from an average of 351 kg of waste recycled per vehicle produced to 405 kg/vehicle, a 15% increase.

We are making significant progress in expanding and improving recycling collection and implementation, especially in GMNA where we have a five-year goal to reduce non-recycled, non-product-output (NPO) by 50% by the end of 2002. To date (through the end of 2001), we have achieved a 54% reduction, one year ahead of schedule. Our goal was exceeded through a combination of waste reduction techniques and recycling of waste. In 2001 GMNA saved \$113 million by recycling 1.9 million metric tons of waste.

## ENVIRONMENT &amp; ENERGY INFORMATION

*Emissions to air:*

## Greenhouse gases

GM supports voluntary initiatives to reduce greenhouse gas (GHG) emissions and, in the U.S., we support the Administration's goal to reduce GHG intensity by 18% by 2012. We have proven leadership in GHG mitigation through various global voluntary initiatives with the various agencies and organizations. A primary outcome of our GHG mitigation strategy was the development of a Global GHG Reporting protocol. This protocol was developed after working with and submitting to the U.S. Department of Energy 1605b GHG reporting guidelines and registry since its inception in 1995.

In 2001 GM implemented its Global GHG Reporting Protocol and, to date, is collecting energy and emissions data from each of its 147 global facilities.

## Global Climate

In addition to developing new technologies and processes, we continue to monitor greenhouse gas emissions from our facilities and products and are taking steps to achieve near-term reductions. We also continue to support scientific research to improve the understanding of the possible long-term effects of economic growth and other human activities on the climate system.

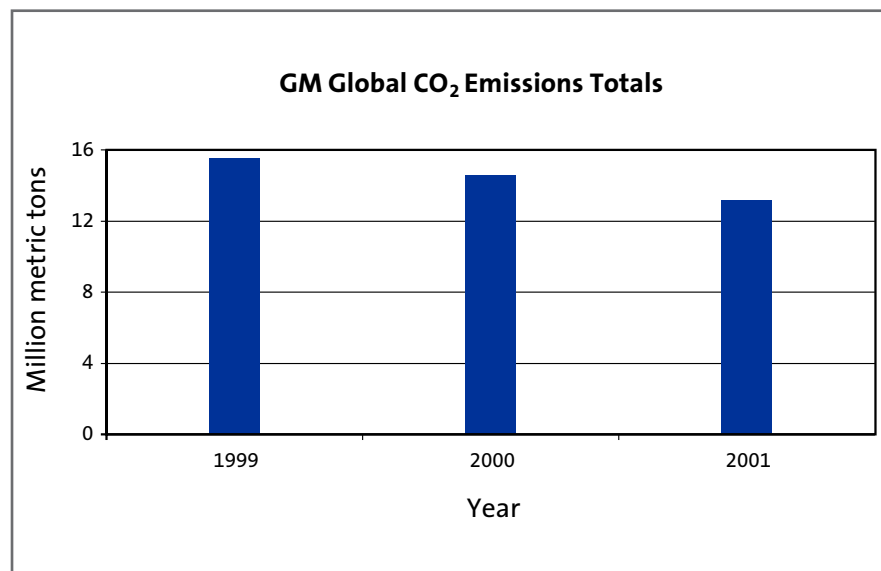
## Greenhouse Gases from Stationary Sources

In 2001, our global facilities emitted 13.2 million metric tons of CO<sub>2</sub> (see graph below), a 9.6% reduction compared to 2000. Facility CO<sub>2</sub> emissions per vehicle produced decreased by 2.2% to 1.64 metric tons. Our CO<sub>2</sub>

emissions are calculated from fuel and electricity use at each facility, which are the major sources of greenhouse gas emissions from our operations.

Our GMNA emissions of CO<sub>2</sub> in 2001 were 9.89 million metric tons, a 7.4% reduction from 2000 levels. In 1995, we were the first automotive manufacturer to voluntarily report greenhouse gas emissions from U.S.

facilities under Section 1605(b) of the Energy Policy Act of 1992 — Voluntary Reporting of Greenhouse Gases — and we continue to provide this information. In 2001, CO<sub>2</sub> emissions from our U.S. facilities were 9.61 million metric tons, a reduction of 16.5% from 1990 levels and a reduction of 6.7% from 2000.



GM's Canadian operations report greenhouse gas emissions as part of the Voluntary Challenge and Registry Inc. (VCR) program. GM of Canada was again recognized as Gold Level Champion Reporter in their 2001 report.

Our Canadian operations have achieved a 47% reduction in CO<sub>2</sub> emissions since 1990. Their CO<sub>2</sub> emissions also decreased 15.1% from 2000 to 2001. For a full report, refer to the Action Plan for Reduction Greenhouse Gas Emissions filed in October 2000 with Canada's Climate Change VCR Registry.

#### U.S. CO<sub>2</sub> EMISSIONS TOTALS (million metric tons CO<sub>2</sub>)

1990	11.51
1999	11.30*
2000	10.30*
2001	9.61*

\* Updated since submittal of 2002 DOE 1605(b) Report.

#### Climate Change Levy

In 2000, Vauxhall was an active participant in obtaining a Negotiated Agreement for the U.K. motor Industry (through its trade body SMMT) in relation to the Climate Change Levy, a tax on business energy use introduced in April 2001. This was one of the first Negotiated Agreements to be approved by the U.K. Government, and provides the motor industry with a rebate against the levy in return for agreed improvements in energy efficiency in terms of vehicle production over the next 10 years.

#### Climate Leaders Partnership

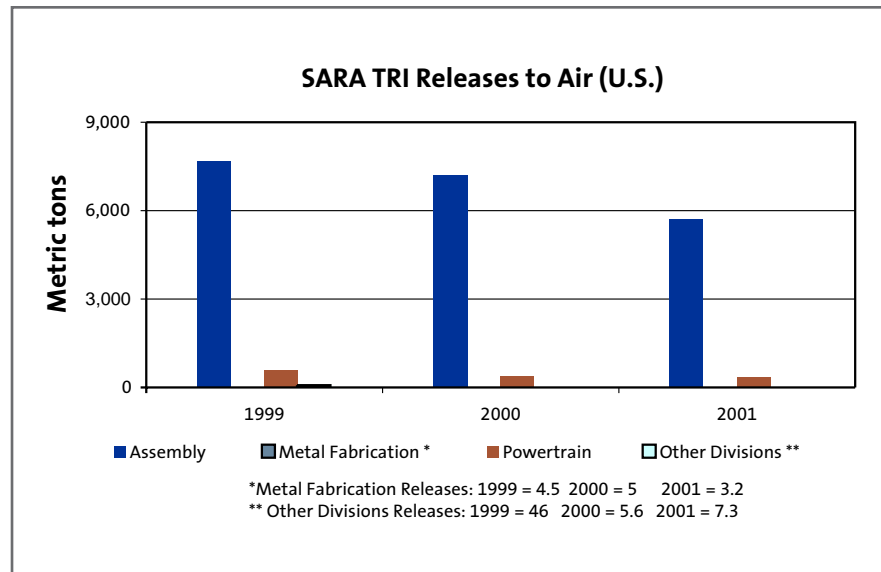
We joined the Environmental Protection Agency's (EPA) Climate Leaders Partnership in 2001. This initiative is a new, voluntary program that challenges its partners to set an aggressive, corporate-wide greenhouse gas (GHG) emissions reduction goal. Through the EPA's Climate Leaders Program, we are committing to reduce CO<sub>2</sub> emissions from our North American Facilities by 10% over five years.

## Air pollutants

## GMNA

Emissions to air are tracked in GMNA using the U.S. TRI and Canadian NPRI. Painting and coating operations at our assembly facilities contribute the majority of air emissions. Paint shop emission reductions have been ongoing since the early 1980's as coating application technologies have undergone extensive improvements. Technologies that contribute to lower emissions are continually implemented as new paint shops are installed and existing shops renovated.

TRI emission levels from our assembly plants decreased 20% between 2000 and 2001, while U.S. production levels were 11% lower in this period. In 2001, 88% of TRI air emissions were from point sources (stacks) and 12% from fugitive or non-point sources.

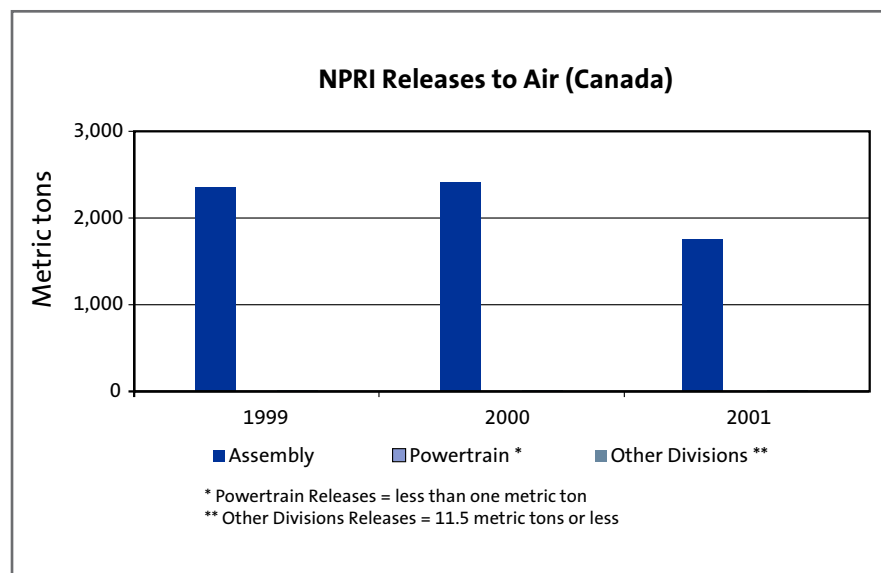


Total Canadian NPRI air releases decreased in 2001 by 27% (3,516 metric tons) compared to 2000 (4,847 metric tons). Production levels in Canada were 14% lower in 2001 than in 2000. In addition to reduced production, decreases were achieved by a combination of efforts at our Canadian facilities including a reduction in purge usage at the Oshawa Car Assembly Plant.

## Criteria Air Pollutant Emissions

The majority of criteria air pollutant emissions arise from burning fuel to supply heat and power to our facilities and from solvents used in the painting of vehicles.

During the past decade we have decreased emissions from heating and power operations by reducing our use of coal burning systems, increasing our reliance on cleaner burning natural gas, and improving the energy efficiency of our



facilities. When replacing coal-burning systems, we are often able to replace larger, less efficient units with smaller, high-efficiency systems. As a result, although we are producing record numbers of vehicles, emissions of particulate matter (TSP), nitrogen oxides (NOx), carbon monoxide (CO), and sulfur oxides (SOx) have significantly declined over this period. The following graph shows our emission levels of these pollutants since 1999.

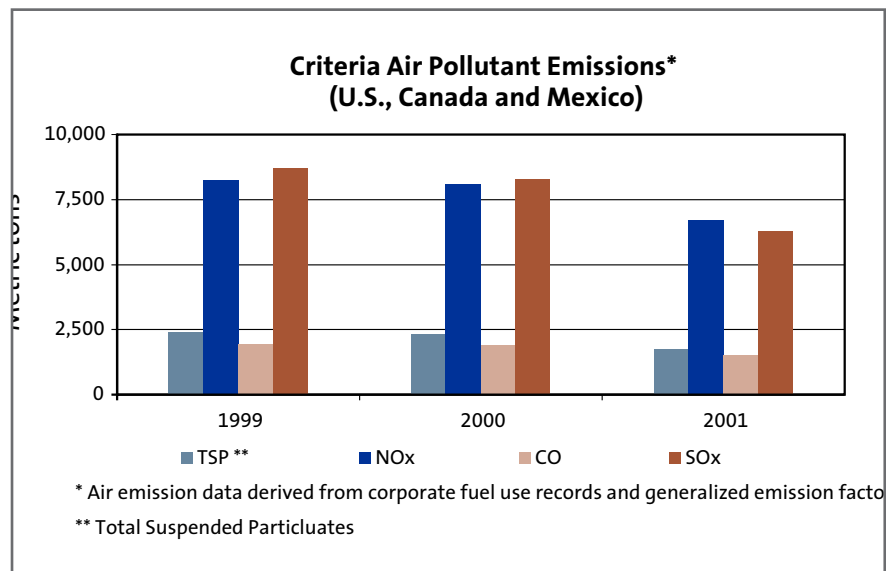
#### Volatile Organic Compounds

Production-adjusted VOC emissions from paint shop operations at our North American facilities fell 2.2% from 2000 to 2001.

We are working hard to improve the consistency of data from all plants around the world and to improve the data collection and maintenance process.

Regional differences in

definitions, terminology, and calculation methods pose challenges and prevent the publication of global VOC data at this time. We are continuing to refine our data management processes in order to provide further quality assurance.



Painting operations are the largest source of volatile organic compound (VOC) emissions in vehicle manufacturing. During 2000, we initiated an extensive effort to minimize the amount of Hazardous Air Pollutants (HAPs) contained in paint coating materials. This is an ongoing effort that has continued in 2001 and will continue over the next few years. To date reductions in VOC emissions have been achieved from:

- Routine coating material reviews for paints
- Limitations on the amount of VOCs used in paint shop purge and cleanup operations concurrent with new programs at several facilities
- Use of powder primer surfacer in the majority of facilities
- New casting programs using lost foam technology for aluminum, blocks and heads. This means lower VOC emissions than iron casting technology. Aluminum engine components increase fuel economy.
- Grilles, mirror housings, cowl screens, bumper caps, and door handles are designed to minimize the need for traditional paint operations -- reducing airborne and waste emissions in production



Additionally our Oshawa Truck Assembly Centre in Canada, in cooperation with Sames, Fanuc and our North America Paint Group, has developed a rotary bell applicator — Aquabell — for waterborne electrostatic paint application. During 2001, the plant retrofitted 60% of its paint shop modules with the Aquabell applicator, making it the first facility in the world to implement

Aquabell technology. Paint transfer efficiency is expected to increase by 21% compared to the electrostatic waterborne Accustat spray system used previously. By improving transfer efficiency the assembly plant realizes several business, operating and environmental benefits, including:

- Reduced paint usage
- Reduced paint cost
- Reduced air emissions
- Reduced paint wastage
- Less cleaning required in the spray booths

With the AquaBell applicator installed on all 10 paint modules, the transfer efficiency improvement translates to a reduction of approximately 60 metric tons of VOC emissions per year.

#### Volatile Organic Compounds at GME

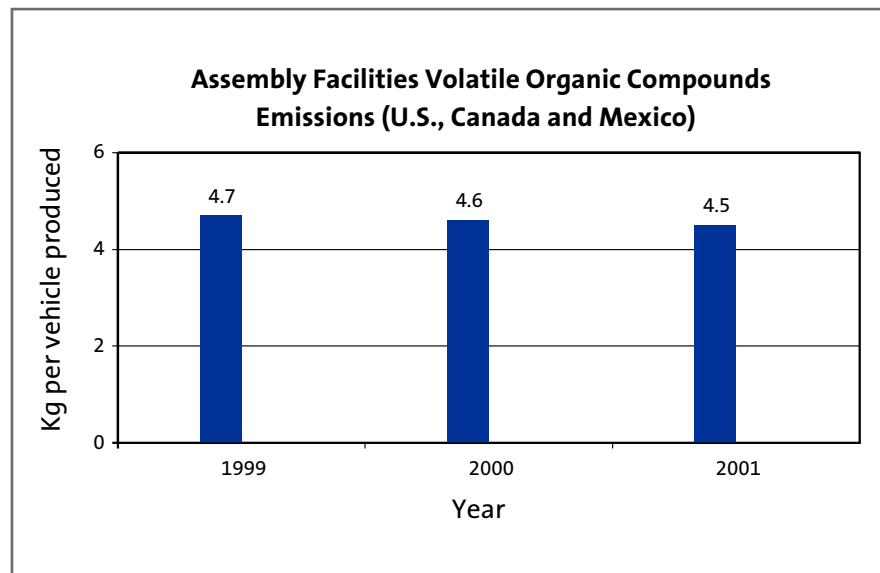
VOCs emissions are one of the four key impacts for which Vauxhall has set corporate targets. In 2001, total emissions fell by 34% against 2000 to 897.4 metric tons. On a per car basis a 22% reduction has been achieved since 1999, exceeding the corporate target of a 17.5% reduction by 2003.

The introduction of waterborne basecoats at the Luton plant and increased efficiency in the painting process, including solvent recovery units that have been installed in 2000 and 2001 at Ellesmere Port, have helped Vauxhall achieve its target..

#### Ozone-Depleting Substances

Starting with the 1995 model year, all air conditioning systems installed in our new vehicles have been ozone-friendly, containing no CFCs or other ozone-depleting substances (ODS). Likewise, since April 1995, we have not used Class I ODS in the vehicle manufacturing process.

We continue to maintain some stationary equipment, such as building air conditioning systems, which contain ODS. Approximately one-half of such equipment has been replaced or converted to non-Class I refrigerants. The remaining systems will be replaced and the ODS refrigerants recovered and recycled over time as this equipment is upgraded. The replacement of all halon fire-protection systems with ODS-free materials was completed in 2000.



## ENVIRONMENT &amp; ENERGY INFORMATION

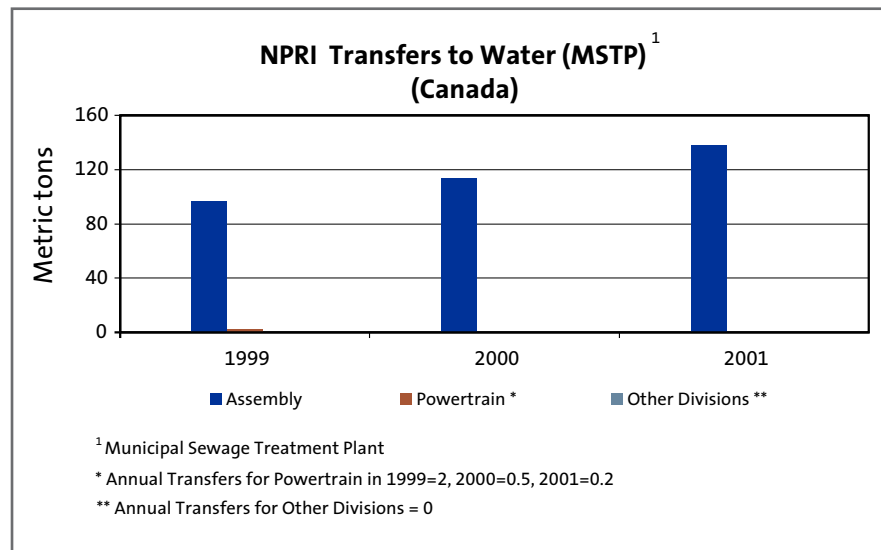
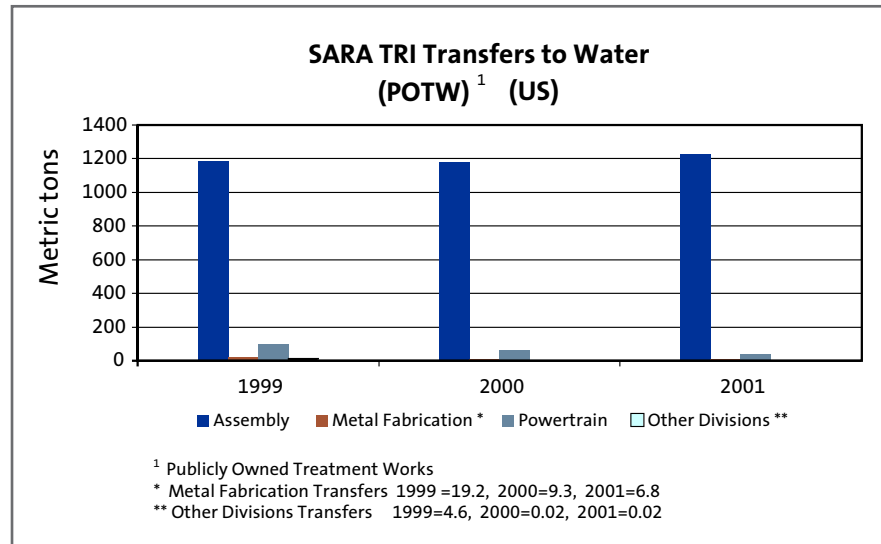
*Emissions to water:*

## GMNA

Water effluents in GMNA are tracked using U.S. TRI and Canadian NPRI data. As with air emissions, vehicle painting and coating operations and industrial wastewater treatment, are the main contributors to water effluents.

Combined divisional TRI transfers to water increased slightly (2.4%) over the period 2000 to 2001.

Production levels in Canada were 14% lower in 2001 in comparison to 2000. Although production levels were reduced in 2001 both TRI and NPRI reported assembly transfers to water increased due to improvements made to estimation methods and additional supplier information.



## ENVIRONMENT &amp; ENERGY INFORMATION

*Land & biodiversity:*

## Land Use, Biodiversity and Clean-up

## Surplus GM Sites

Our objective is to return our surplus properties to productive uses while being sensitive to the economic impact on local communities, public agencies and GM itself. Local real estate experts, business leaders and government officials are consulted in determining the most suitable reuse.

## State and Superfund Sites

When developing cleanup plans at state and federal Superfund sites, we evaluate future land uses and ecological habitats. The absence of a current property owner and the diverse interests of the various stakeholders often complicate developing a cleanup plan consistent with a productive end use for these sites.

## Outreach and Educational Projects

We recognize the need for restoring and protecting wildlife habitats, in particular those that are sensitive or endangered. In addition, to ensure children continue to build on the efforts of the current generation, we conduct outreach programs to educate youth on the importance of biodiversity.

## Helping to Protect the Brazilian Rainforest

In 2001, we launched a major initiative to restore and protect over 30,000 acres of degraded rainforest in southern Brazil, an area twice the size of Manhattan. The Brazil Atlantic Rainforest Restoration Project — a collaborative undertaking between ourselves, The Nature Conservancy Council and the Sociedade de Pesquisa em Vida Selvagem e Educação Ambiental (SPVS, a leading Brazilian conservation organization) — was formed to purchase privately owned agricultural land in Brazil's Atlantic Forest and convert it into a private nature reserve owned and managed by SPVS. The \$10-million project aims to protect in perpetuity this critical wildlife habitat while stabilizing the environmental health of the Cachoeira River valley, reducing slash-and-burn clearances and pollution, and creating economic opportunities for nearby communities.

HYATT HILLS GOLF COURSE  
CLARK, NEW JERSEY

The site of the former Hyatt-Clark facility, built in 1938, has been converted from an industrial site into a much sought after recreational resource. After the facility closed and demolition activities began, we met with local officials to review potential future uses for the site. Our evaluation of the potential uses for the site revealed a viable market for a public golf course. In 1996 the local community reclassified the land for use as a golf course, allowing us to conduct necessary remediation work and environmental studies. The course, which we will continue to own, will be operated by the local communities. The course opened in the summer of 2002. Environmental issues at the site have been addressed under the New Jersey Industrial Site Recovery Act with supervision by the New Jersey Department of Environmental Protection.

With only 5% to 7% of the Atlantic Forest intact, restoration is considered one of the world's highest conservation priorities. An amazing 53% of the trees and 77% of other plant species found in the Atlantic Forest are unique to this ecosystem. Fifty species of mammals and 158 species of birds are found nowhere else on the planet, and 171 of Brazil's 202 officially recognized endangered species depend on the Atlantic Forest for survival. One of the main objectives of this project is the creation of a scientifically based model for biodiversity protection and ecosystem restoration on a large scale. Among the scientific goals will be to quantify and document the environmental services performed by the restored forest, such as absorption of atmospheric carbon, in order to understand the role that reforestation can play in responding to concerns over the global climate.

SOCIAL INFORMATION

**“ Corporate responsibility at GM requires support for its values, which include embracing diversity and fostering a work environment where all people feel safe and respected. ”**

- Rod Gillum,  
Vice President, Corporate Responsibility & Diversity

## SOCIAL INFORMATION

*Workplace:*

## Health &amp; Safety

General Motors has a long history of establishing world-class health and safety programs and reducing risk in the workplace. Joint programs with trade unions and specialized employee training initiatives have helped us become the leader in health and safety performance in our industry. We have developed a practical risk-assessment methodology that is used during the design of machine safety features. Known as Safety 21, the system has dramatically improved machine safety resulting in reduced risk to our employees and increased uptime. Safety 21 is a joint effort between our engineering and safety professionals, the United Auto Worker's Union and our employees.

We are in the early stages of establishing a common global health and safety management system structured around the ISO 9000-2000 Quality Management System. This common process provides the framework for effective management of numerous programs and procedures, including:

- GM Global Best Health and Safety Practices
- Ergonomics
- Safety Through Design
- Contractor Safety
- Skilled Trades Safety
- Employee Well-being
- Employee Assistance Programs
- Industrial hygiene evaluation
- Due diligence surveys

We belong to numerous health and safety industry and business associations that focus on employee health and safety. Experience has proven that such partnerships have symbiotic benefits, where we learn from benchmarking against other organizations and in turn share our best practices. GMNA memberships include:

**GM HEALTH AND SAFETY POLICY**

We are committed to protecting the health and safety of each employee as the overriding priority of this Corporation. There will be no compromise of an individual's well-being in anything we do. The implementation of actions to help our employees realize a healthy, injury-free environment is a leadership responsibility. Continuing support of this effort is the responsibility of everyone. We will lead the General Motors team to ensure that we protect the well-being of every member.

General Motors President's Council (1994)

- National Safety Council
  - American Industrial Hygiene Association
  - American Society of Safety Engineers
  - Organization of Resources Counselors
  - National Association of Manufacturers
  - Automotive Industry Action Group
  - American National Standards Institute
- \* Industry Cooperation on Standards Conformity and Assessment

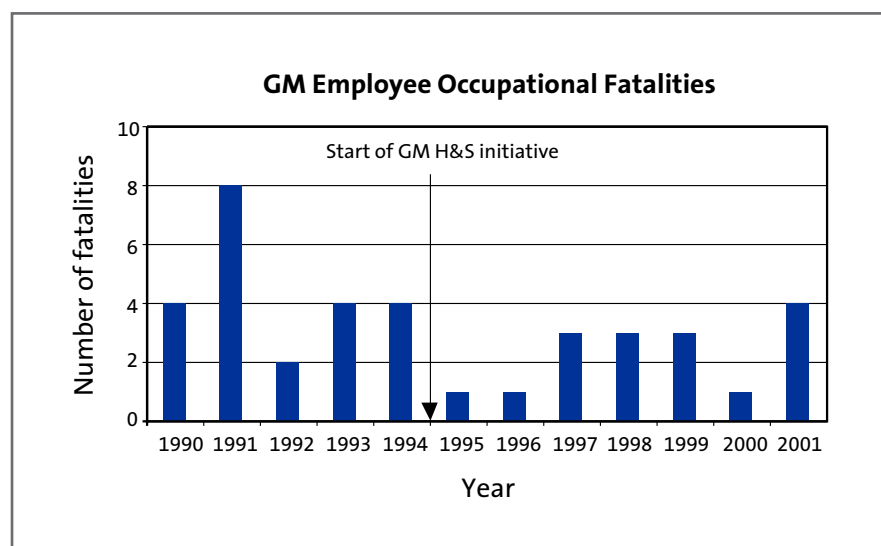
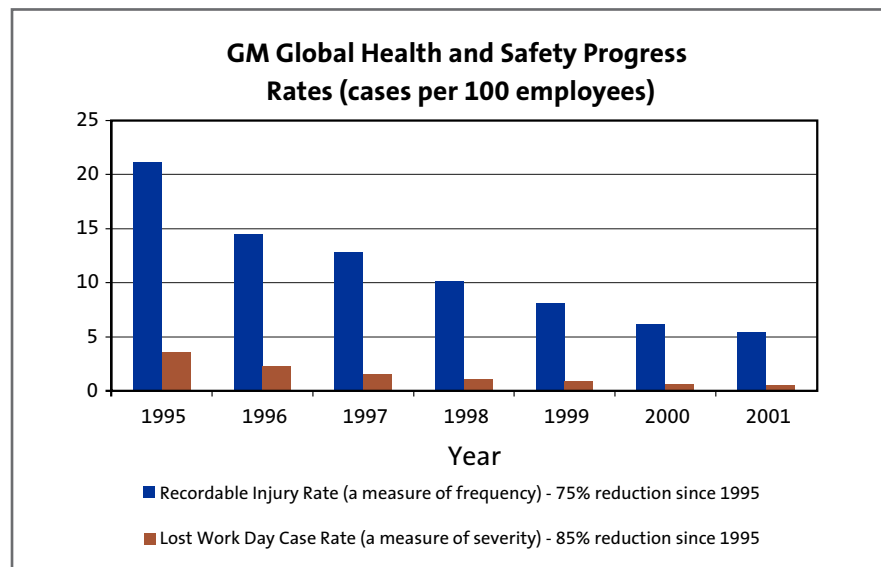
Consistent with GM's Core Values, our global team continues to aggressively pursue improved safety performance for employees and contractors alike. While proud of our world-class performance in the automotive sector, we are particularly concerned with serious injuries and fatal accidents. To reduce risk to our workers, we are accelerating skilled trades and non-routine task safety performance. In

addition, global leaders are instituting a "Make it Personal" campaign to make it clear that safety of employees is the overriding priority of this company and of its leaders.

Our efforts have resulted in dramatic improvements in employee health and safety as described below.

#### Health and Safety Performance

Following the introduction of a major worldwide health and safety initiative early in 1995, our health and safety performance has improved markedly across the three areas of recordable injuries, lost work day cases and occupational fatalities.



Between 1995 and 2001:

- the recordable injury rate per 100 employees for our global operations dropped by 75%
- lost work day cases per 100 employees fell by 85%.

Between 1990 and 1995, there were 23 occupational fatalities; for the period 1996 to 2001 there were 16, a reduction of 30% between the two periods.

Overall, improvements in managing health and safety risk mean our operations are safer than ever before for our employees, with the figures proving that accidents in our facilities are much less frequent and much less severe.

#### Recordable Injury Rate

Our worldwide recordable injury rate (per 100 employees) in 2001 was 5.4, an improvement of 13% over 2000. Each global sector has shown dramatic improvement since 1993:

- GMNA recorded a rate of 5.45 in 2001, down from 29 in 1993.
- GME recorded a rate of 5.62, down from 24.8 in 1993.
- GMLAAM recorded a rate of 3.83, down from 4.98 in 1993.
- GMAP recorded a rate of 5.88, down from 48 in 1993.

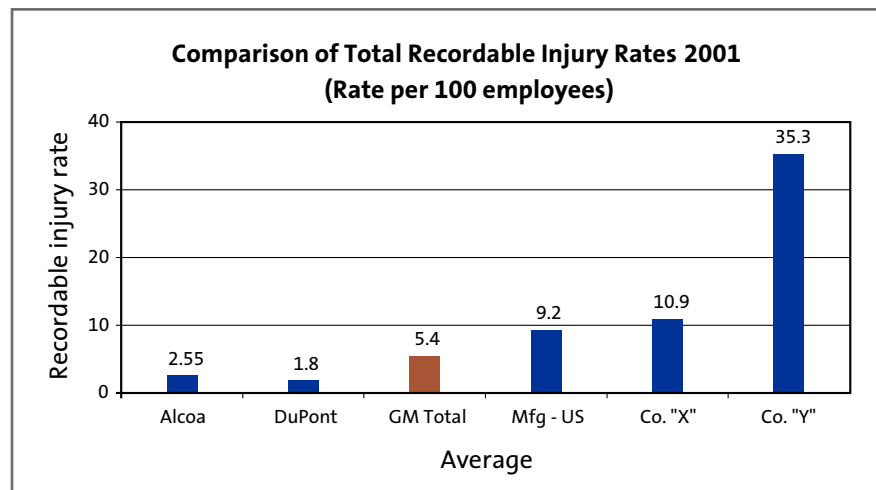
Our sustained performance has placed us as the industry leader. We continue to benchmark the world-class performance of other industry leaders like Alcoa and DuPont.

#### Lost Day Rates

GM's lost workday case rate was 0.51 in 2001, an improvement of 19% against 2000. As with recordable injuries, each global sector contributed to significant reductions in the more severe lost workday cases:

- GMNA recorded a rate of 0.53 in 2001, down from 4.5 in 1993.
- GME recorded a rate of 0.86 for GME, down from 3.49 in 1999.
- GMLAAM recorded a rate of 0.66 for GMLAAM, down from 2.08 in 1995.
- GMAP recorded a rate of 0.67 for GMAP, down from 12.4 in 1995.

GM continues as the industry leader while pursuing our benchmarks of Alcoa and DuPont.





### Significant Achievements and Milestones

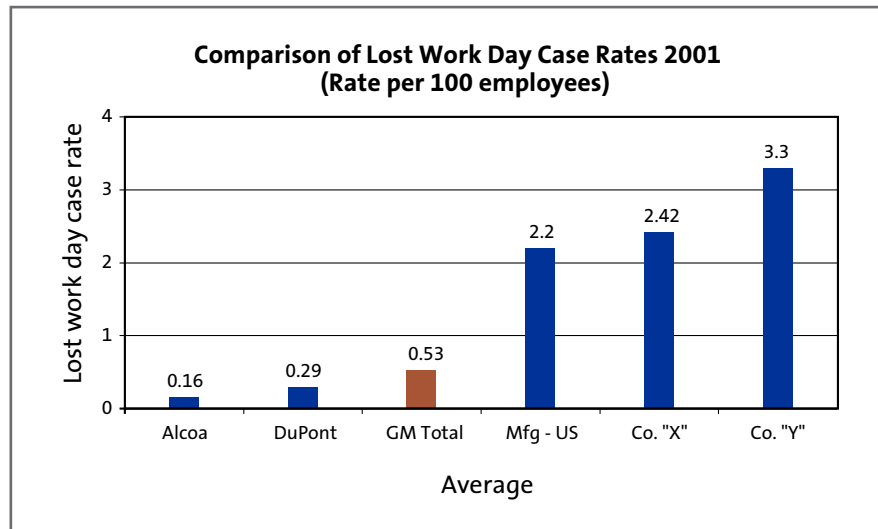
Sixty-six GM facilities, worldwide, reached significant milestones in health and safety performance during 2001. These locations achieved the status of working more than 1 million hours without a Total Recordable Incident and/or Lost Work Day Case. This compares to 39

facilities achieving the

same milestones in 2000, a 41% improvement. Two of our plants, Toluca, Mexico, Truck Assembly and SPO Moncton PDC, New Brunswick, Canada, achieved the outstanding record of working more than six years without a Lost Work Day Case.

During 2001, two manufacturing complexes achieved the enviable record of working 10 million hours without a Lost Work Day Case. One was the GM de Mexico Ramos Arizpe complex. The other, GMAP Thailand, earned the Prime Minister's Award as the country's best safety performer in manufacturing. GM North America again earned the National Safety Council "Safety Improvement" award.

In addition, 102 facilities of our facilities worldwide achieved health and safety performance equal to or better than the Alcoa benchmark.



## SOCIAL INFORMATION

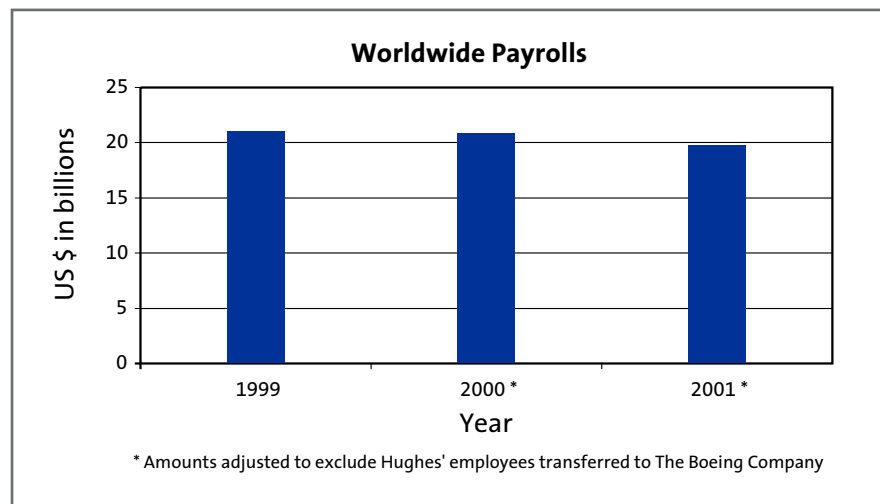
*Workplace:***Wages and benefits**

We are proud of our compensation policies and practices around the globe. Jobs at our facilities are highly sought wherever we operate. Compensation and benefit practices vary widely around the world, according to local customs, competitive markets, and local regulations. Our market-based compensation meets or exceeds all legal requirements. Health care is provided to all employees, in accordance with local laws, customs, and practices.

Wages and benefits are not in all cases negotiated with local unions. In locations where our employees are represented by unions they typically are negotiated. Not all of our locations are represented by unions.

Pensions are not provided to all employees. Our philosophy with respect to benefits is to provide them whenever it is customary to do so in the specific country of operation. While in many, if not most, countries it is customary to provide pensions, in some countries where we operate it is not, e.g., Poland, Colombia, and Hungary, and, therefore, we may not provide such a benefit.

Labor issues, such as wages, benefits, hours, and working conditions within our GME operations are managed to respect European Union and national legislation and through the collective bargaining process, where applicable. Internal employee representation systems are established in all countries in which we operate.

**Employee health benefits**

We are the largest private purchaser of health care in the United States and in 2001 provided health care cover coverage to 1.2 million employees, retirees and their dependents at a cost of \$4.2 billion. Through focused initiatives, including many joint GM-union programs, we are working to improve the quality of health care for employees, retirees and their families, and the communities in which they live. Key focus areas include:

- Improving quality in the care delivery system
- Reducing waste and inappropriate care
- Encouraging the appropriate use of prescription drugs
- Promoting wellness and disease prevention
- Improving patient safety

We are leading the effort to improve patient safety and quality, so that patients have access to the right care and service, at the right time and in the right place. Working with the Business Roundtable and other Fortune 50 companies, the Leapfrog Group was created in 2000 to make health care a priority. These companies are committed to quality and safety standards for purchasing services. This initiative developed the following three standards, which can reduce serious medical errors.

- Computer Physician Order Entry: This is a system in hospitals which prevents medication prescription errors and can reduce death and serious injury by more than 50%;
- Volume-based Referrals: Referring patients to hospitals that meet specific criteria for certain medical treatments is a key ingredient in the fight against medical errors;
- Intensive Care Unit Staffing Standards: These standards ensure the correct staffing resources and skills in intensive care units.

One of our key focus areas is to encourage enrollees to use the right prescription drugs at the right time. Prescription drugs are the most inflationary component of our health care costs and represent 24% of our total health care costs. Prescription drugs costs continue to rise because of increased utilization, cost inflation and an increase in the use of new, more costly drugs.

We support medically appropriate and cost-effective prescribing and dispensing practices including generic substitutes when appropriate. Generic drugs offer a valuable option for patients who are taking prescriptions. More physicians and pharmacists are encouraging the use of generic equivalent medications. Generic drugs contain the same active ingredients as the brand-name drugs and are just as safe and effective. The U.S. Food and Administration (FDA) carefully monitors generic drugs. By increasing generic drug usage 1%, we can save over \$14 million.

Selected healthcare organizations that we are partners or members of include.

- Greater Detroit Area Healthcare Council
- The Leapfrog Group
- National Committee for Quality Assurance
- Michigan Antibiotic Reduction Resistance Coalition

#### Employee pension benefits

In the U.S., we manage two separate pension plans for employees - one for hourly employees and one for salaried employees. The Hourly Pension Plan and the Salaried Retirement Program both compare very favorably as measured by leading U.S. benefits consulting firms against the retirement programs for employees at other leading U.S. manufacturing companies.

#### GM Hourly Pension Plan

Our GM Hourly Pension Plan was adopted in the U.S. in 1950 following negotiation and agreement with our affiliated trade unions. The benefit plan covers all hourly employees who have worked for the company for more than five years. No contributions are made by employees. Vesting under the Plan is achieved once an employee accumulates five years of credited service. The retirement age under the Plan is 65 but employees can retire at any age once they have completed 30 or more years of credited service. If an employee meets certain eligibility requirements, supplements are payable until age 62, the earliest date when Social Security benefits are available. Upon the death of a retiree, an eligible surviving spouse would receive 65% of the retiree's lifetime pension benefit.

BENEFIT FROM HOURLY PENSION PLAN (with 30 years of credited service)	
Age	
Up to 62	\$2,730 per month (\$32,760 annually)
62 and over	\$1,420 per month (\$17,040 annually) + Social Security benefit
Upon the death of a retiree	An eligible surviving spouse would receive 65% of the retiree's lifetime pension benefit.

Significant improvements have been made to the Plan in its more than 50 years of existence. This table summarizes the actual current benefits.

In the U.S. there were 339,000 hourly retirees and surviving spouses at the end of 2001, and payments under the Hourly Pension Plan totaled \$4.6 billion for the year.

#### GM Salaried Retirement Program

The current Salaried Retirement Program is a defined benefit pension plan applicable to all regular salaried employees and was adopted in 1950. It includes all of the features of the Hourly Pension Plan. Additionally, there is a monthly voluntary employee contribution, which is minimal — 1.25% of monthly base salary over \$3,000. However, the benefits upon retirement are very favorable as a vested employee could receive in retirement 100% of their employee contributions in one year and continue to receive such additional benefit for their lifetime.

For all new employees with a service date on or after January 1, 2001, we will contribute a percentage of basic monthly pay, based on the employee's age, into an individual account for each new employee. The account is vested with the new employee after five years of credited service. No employee contributions are permitted under this new feature of the Program. The new feature was adopted, in part, to address the changing nature of the salaried workforce.

In the U.S. we had 114,900 salaried retirees and surviving spouses at the end of 2001, and payments under our salaried Retirement Program totaled \$2.0 billion.

#### Employee Investment Schemes

We make available to employees the Promark Social Equity, Domini Social Equity, and Neuberger Berman Socially Responsive Fund. These investment portfolios consist of only the stock of companies deemed socially responsible.

## SOCIAL INFORMATION

*Workplace:*

## Equal Opportunity

In the United States, individual civil rights are protected by both state and federal laws. The majority of state civil rights laws mirror federal law. These civil rights laws generally prohibit an employer from discriminating against an individual based on certain characteristics such as age, sex, race, color, national origin, disability, marital status, etc.

In addition to our commitment to comply with state and federal laws protecting individual civil rights, we have available a written and widely distributed policy on equal employment opportunity and harassment. This prohibits all forms of harassment such as sexual harassment, and harassment based on characteristics such as age, gender, race, color, religion, disability, national origin, sexual orientation or veteran status. The policy clearly states that there will not be any retaliation against employees who bring harassment to the attention of appropriate management.

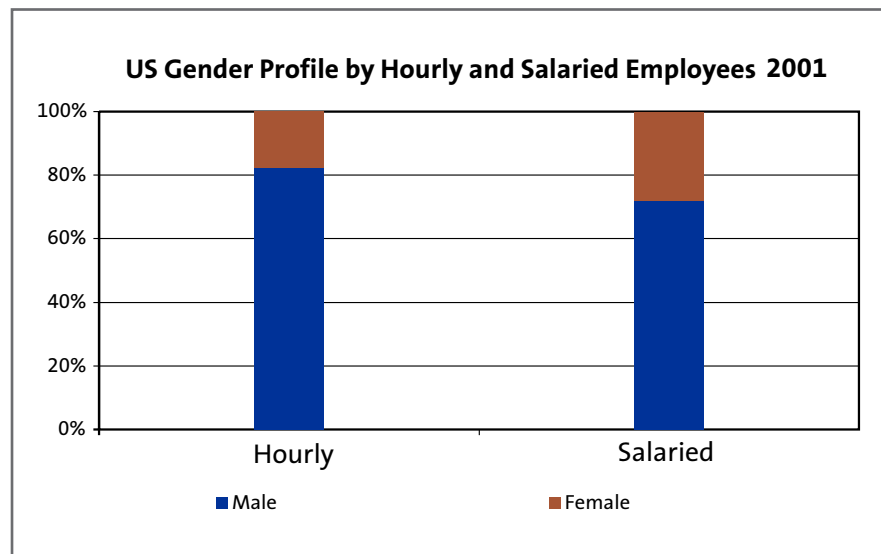
The Integrity in the Workplace booklet in our Winning With Integrity series, published in 1998, addresses the issues of the rights and responsibilities of employees toward one another and our commitment to equal employment opportunity. Specifically, these materials make it clear that our company policy is to hire, promote, train and pay based on merit, experience and other work related criteria. The Corporation values diversity and strives to create an environment which is supportive and tolerant of differences.

We have also adopted the Global Sullivan Principles, which include support for universal human rights and promotion of equal employment opportunity for employees at all levels of the company with respect to matters such as color, race, gender, age, ethnicity and religious beliefs.

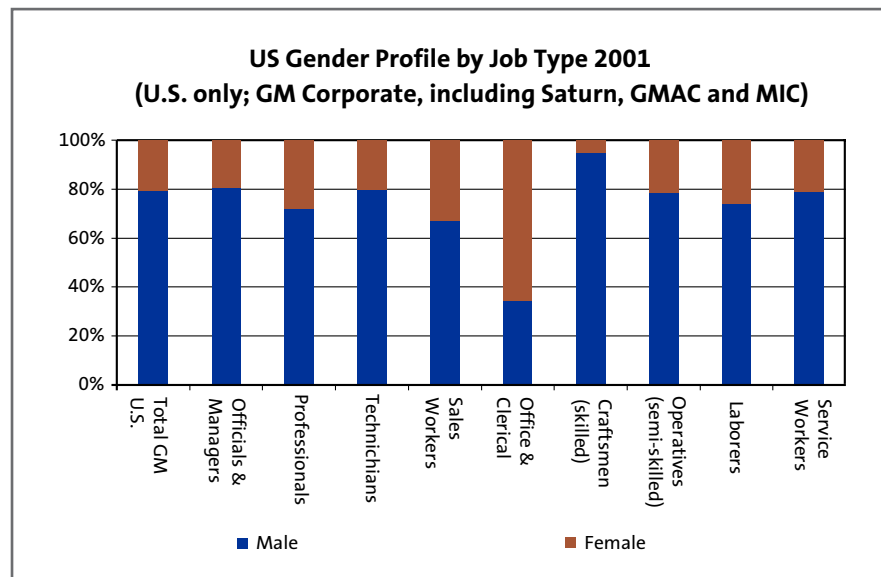
## Gender

## GMNA

In the U.S., the ratio of male to female employees is four to one with female employees making up 20.6% of the workforce. Broken down by hourly and salaried employees, women make up 17.8% and 27.9% respectively, as shown in the chart below.



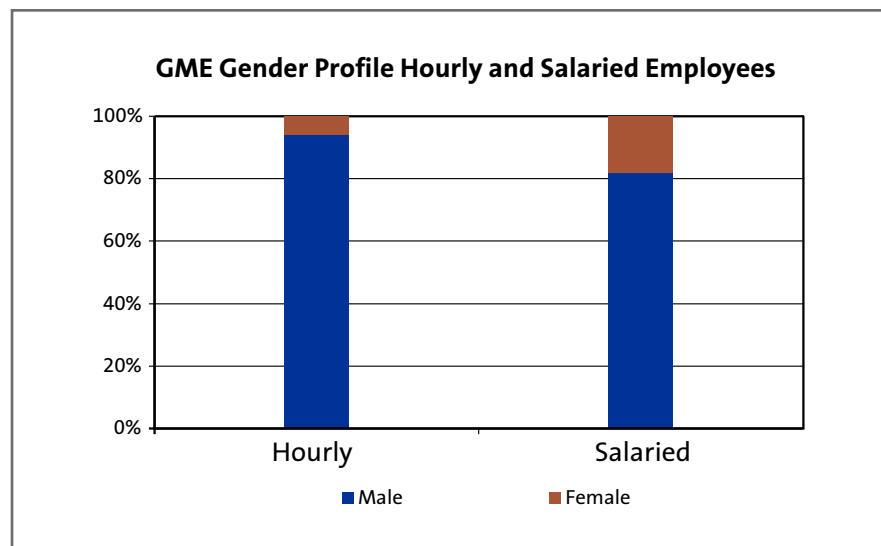
The chart below gives the breakdown of male and female employees by job type in the U.S. In the U.S., women occupy 18.5% of all official/management positions and 26.0% of all professional positions within GM. Including Saturn, GMAC, and MIC the figures are 19.3% and 27.9% respectively.



#### GME

In GME facilities, the percentage of women in the hourly and salaried workforces are 6% and 18% respectively. The data vary significantly between countries. For instance, in GM Turkey, there are very few women in the hourly workforce but women make up 28% of salaried employees there, second highest behind Hungary with 31% female employees.

The gender profile of the GME workforce across different salary grades is shown below.

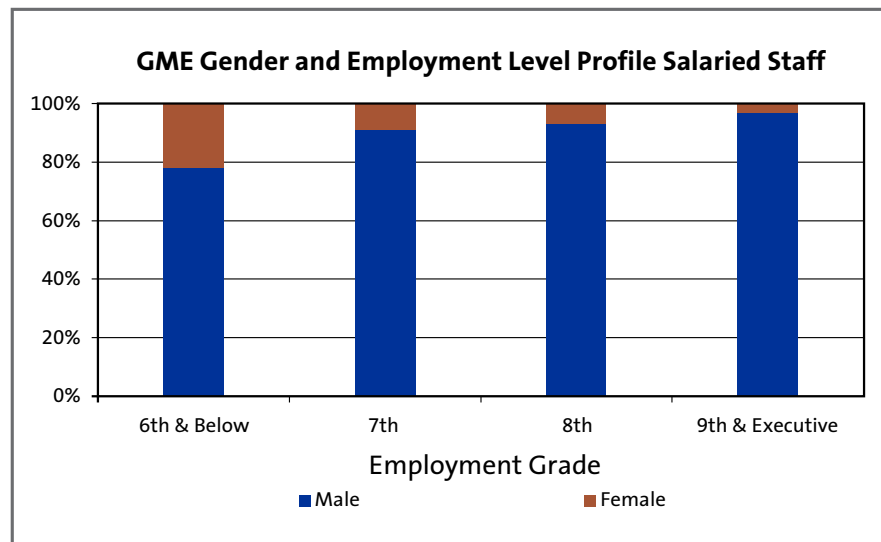


## Age

## GME

The age profile of the GME workforce shows that for hourly employees the average age is 41 compared to 43 for salaried employees.

For hourly workers the average age for males is 41 and for females 39. For salaried workers the average age for males is 46 and for females 40.

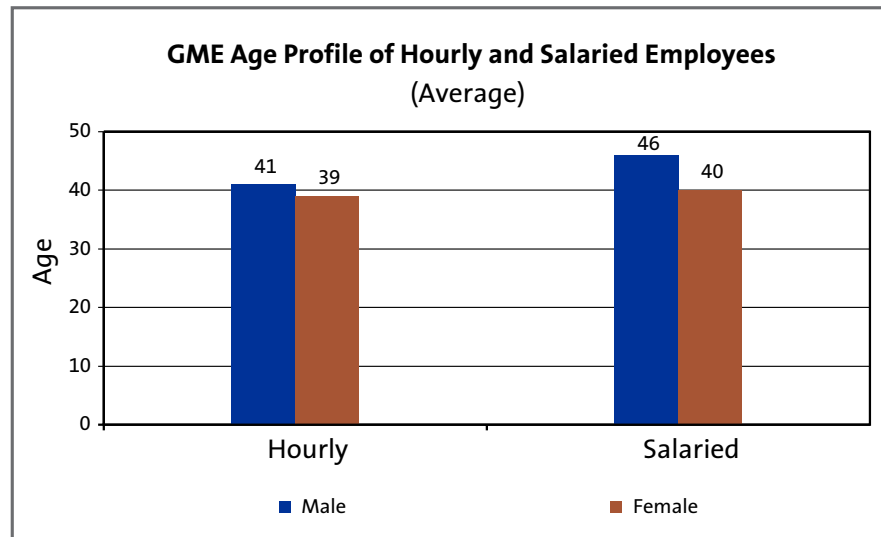


## Minority Employees

## GMNA

The following chart shows the distribution of minority employees in hourly and salaried ranks in the U.S.

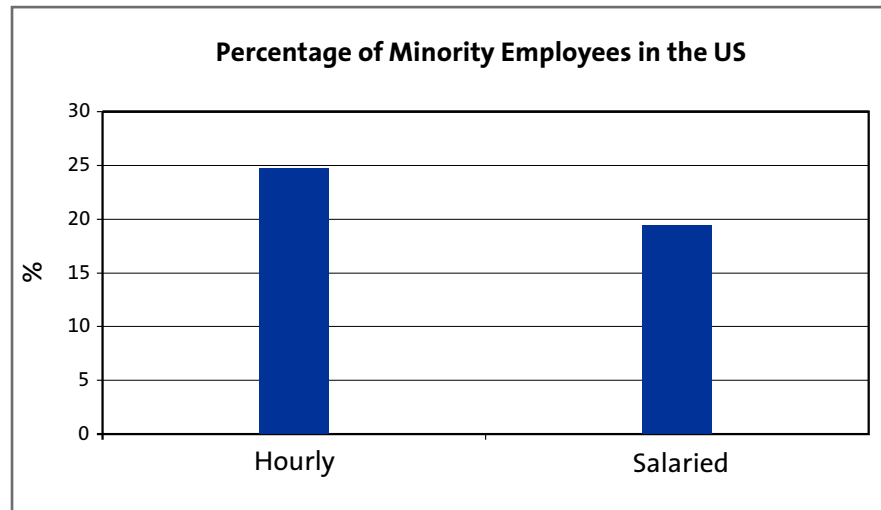
The chart below indicates representation of individual minority groups in the salaried and hourly workforce in the U.S.



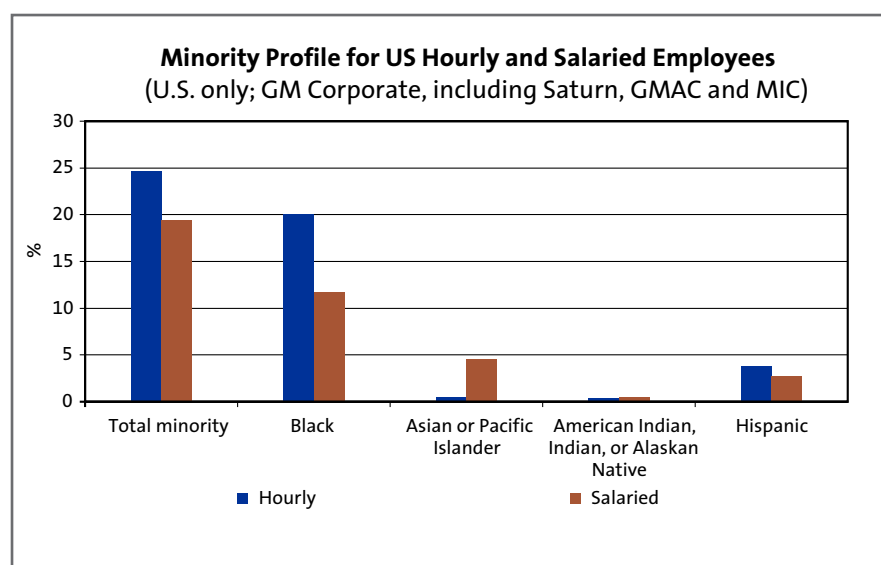
### Discrimination-related agency charges

During 2001 in the U.S., we received 310 discrimination charges compared to 271 in 2000. The basis upon which these charges were filed includes race, gender, age, disability, national origin, religion and sexual harassment. During 2001, 62% of the charges were found to have no

probable cause, 30% were administratively closed and 4% were found to have probable cause. The remaining 4% of cases were resolved through settlements with the respective governmental agency or employee. The data suggest that we have done a good job of trying to eradicate discriminatory behavior in the workplace.



In 2001, the U.S. Office of Federal Contracts Compliance Programs conducted 10 compliance reviews at selected facilities. In these reviews, four facilities were found to be in compliance, four facilities resolved issues through mutual agreement with the governmental agency, and two facilities are awaiting final determinations.



In Europe, we have signed formal agreements on racism and tolerance with GM's German Works Council (labor union leaders). Litigation regarding discrimination is rare in Europe.



## SOCIAL INFORMATION

*Workplace:*

## Training &amp; education

Total customer enthusiasm is at the core of all of our initiatives. This means continuous improvement in everything we do. As a result, our employees need to be equipped with the skills and knowledge required to continually improve and help meet our vision of being a world leader in transportation products and related services. Educating our workforce to achieve the highest standards in their jobs is therefore one of the highest priorities of the Corporation.

We also believe that it is essential to invest in organizations dedicated to improving the educational capacity of the communities we serve. To the educational community, this means partnerships focusing on creating learning opportunities for many, including minorities and women, as they prepare for a career in tomorrow's workplace. We have consistently been a leading contributor to education providing funding from elementary through to post-doctoral level.

## GM University

In 1997, we formed General Motors University (GMU), a global network of education and training resources aimed at helping our employees continuously improve their competitive performance and drive success at General Motors. GMU has grown to be one of the world's largest corporate universities for salaried employees.

GMU's vision is to provide leading edge learning resources that help develop professional excellence resulting in technical and business leadership. It focuses on improving GM's business results and developing a performance driven culture by:

- Building professional skills and capabilities that are linked to performance and results
- Fostering faster learning and change management in our global operations
- Developing programs that build our leadership strength

GMU's learning is aligned with 16 of our global business processes and functions. For each business process, a dean is responsible for delivering learning that develops capability and drives performance in that function. The president of General Motors University and the Council of Deans set GMU direction and run its operations.

GMU provides real-world education using innovative learning techniques in class and online. Currently, GMU offers approximately 1,500 courses to 86,000 managerial, executive, professional and technical employees. In 2001, GMU provided approximately 190,700 student days of learning.

Currently, two technologies are key to GMU's courses — Interactive Distance Learning (IDL) and e-Learning — both of which provide fast, inexpensive ways to provide and redistribute skills and knowledge more broadly to the workforce. GMU uses IDL and e-Learning in company and dealership training in North America and increasingly worldwide.

Interactive Distance Learning (IDL) is linked to 6,885 dealership and company sites in North America. It is used for interactive learning broadcasts concerning sales and service as well as a range of technical and professional topics. This system is also used for our Quarterly Satellite Broadcasts. GMU has twelve broadcast studios that support satellite delivery across the dealer and corporate network. In 2001, IDL use increased 12% over 2000. Usage in just the first six months of 2002 exceeded total usage in 2001.

E-Learning uses our web capability to improve the access and availability of GMU courses. Still in its early stages, GMU plans to provide a growing percentage of e-Learning courses that fit more easily into employee schedules and eliminate the expense and inconvenience of travel to a classroom. This move will improve the effectiveness and efficiency of employee learning and promote greater usage of common content across the globe. In some instances, IDL and/or e-Learning may be combined with traditional classroom sessions to provide 'blended' learning that can make the overall approach more effective and efficient for certain topics.

SOCIAL INFORMATION

## Workplace:

### Employee Satisfaction

Our Employee Enthusiasm Strategy focuses on engaging our employees with positive leadership behavior and effective systems and strategies for managing our employees. We emphasize personal safety and economic stability and have pledged to develop and promote policies and programs that assist our employees both at work and in their home environments.

#### Job satisfaction levels

Employees are a key component in assuring our success and since the 1940's we have researched how our employees feel about their jobs and the company. During 2000, the first global employee survey was launched, expanding on an international pilot launched in 1998. Overall, 40% of employees from around the world participated in this first global census and the goal is to increase participation in our next global employee census in 2003. The survey will include questions about corporate goals and objectives, a sense of urgency, product and customer focus, innovative products and services, improved business results, leadership, integrity, communication, involvement, teamwork, and learning and development.

With the 2003 employee census, our aim is for a greater number of work teams in individual locations around the globe to develop action plans for improvement based on the census results. This occurred on a more limited basis with the 2000 global census and teams will be responsible for understanding the data for their site or region, benchmarking against local norms, and developing local action plans that aim to improve employee satisfaction and survey ratings.

## SOCIAL INFORMATION

*Workplace:***Human rights and labor standards**

Support for human rights at GM begins with treating each other with respect and dignity. Our employees are responsible for respecting one another in their business relationships and in the communities in which we operate. We acknowledge the rights of our employees and believe that our policies on fairness and respect show our support for employee's rights.

We honor all local laws and respect local customs throughout our global operations and our approach to specific human rights and labor issues is outlined below.

**Child Labor**

We believe that education should be a primary objective for children. We therefore respect all local laws regarding compulsory school attendance and do not employ children under the legal age for employment in any location. Our Worldwide Purchasing Policy prohibits our suppliers, and their subcontractors, from using child labor in the supply of goods or provision of services when under contract with GM.

**Forced Labor**

The decision to seek employment is voluntary, and we do not condone involuntary servitude in any form. Our Worldwide Purchasing Policy prohibits the purchase of goods produced with the use of forced or slave labor. This policy applies to our global operations and to all of our joint ventures.

**Indigenous Rights**

In various geographic locations, we employ executives in decision-making capacities that represent the indigenous people. These locations include, but are not limited to, Taiwan, Indonesia, India, Japan, Korea and Thailand.

**Freedom of Association**

As part of our corporate policy, we respect the right of all employees to choose whether to belong to a union. This concept is also outlined in the Global Sullivan Principles and, in adopting these principles, we have specifically endorsed respect for employees' voluntary freedom of association.

We are also committed to complying with all laws relating to the rights of employees to organize for purposes of collective bargaining. In this regard, the legal right of employees to support or oppose union membership without fear of coercion or retaliation is recognized by the corporation.

In recognizing these rights, our employees will not be subject to coercion from GM, or from any individual or external organization.

#### GM AwareLine

We have a 24-hour toll-free telephone reporting system that is available on a global basis seven days a week. The GM Awareline allows employees to anonymously report various concerns, such as: possible criminal wrongdoing by the company, our management, supervisors, employees or agents; actions believed to be contrary to corporate policy; emergency or life threatening situations; or allegations of harassment. Appropriate personnel investigate every complaint that comes into the AwareLine.

Our business units around the world have customized this reporting process to meet local language and cultural needs. Our operations that choose not to use the AwareLine process in a given country or location because of legal or cultural reasons are required to implement an alternate process, which must be approved by our General Director of Global Security.

In addition, we have the following processes in place throughout the our operations:

#### The Grievance Process

Grievances or complaints by U.S. hourly employees are handled pursuant to the procedures specified in national and local collective bargaining agreements. These differ from procedures for salaried employees.

#### Open Door Policy

For salaried employees, complaints in the U.S. are managed according to the Open Door Policy, detailed in "Working with GM." The objective of the Open Door Policy is to ensure an open channel of communication with management when employees have a question, concern or complaint about any aspect of their employment.

## SOCIAL INFORMATION

*Workplace:***Security**

We are committed to providing a safe and secure work environment. Our security personnel support the entire corporation in this commitment to provide a safe and healthy work environment for all employees. Our security personnel also strive to protect property assets, including proprietary information, and to reduce interruption to business operations.

Security employees subscribe to the same code of conduct that all GM employees do - Winning with Integrity, Our Values, and Guidelines for Employee Conduct. Supplier employees subscribe to their own codes of conduct, but while on GM property, are held to at least the same level of conduct as employees.

Primarily, we contract for security services. The vast majority of site contractors are guided by an agreement and statement of work that references GM Security policies and standards found in the GM Global Security Manual. We are working to ensure that similar agreements and statements of work cover the few remaining site security service contractors. As its name implies, the Global Security Manual is applicable on a global basis and is available to sites through the GM Intranet.

All security services must apply for approval from the head of the corporate security organization and pass a rigorous review prior to providing armed security personnel. One of the criteria is training in the use of force. Very few sites have armed personnel and only in countries with a high level of threat.

We rely on federal, state, provincial and local law enforcement personnel to enforce existing laws designed to protect citizens and businesses from unlawful actions that could harm employees, contractors, visitors and property. We provide assistance upon request to law enforcement, but do not direct the efforts of government personnel.

## SOCIAL INFORMATION

*Community:*

## Diversity

## Diversity Vision and Strategy

*"Having people of different ethnic, racial, and social backgrounds in our corporation has not slowed our pursuit of excellence — it has accelerated it."*

— Jack Smith  
GM Chairman

We believe that diversity is the collective mixture of similarities and differences. This recognizes that diversity includes race and gender as well as the broader aspects of age, education level, family status, language, military status, physical abilities, religion, sexual orientation, union representation, and years of service. We believe that working with a diverse group of individuals with differing backgrounds and perspectives creates and maintains competitive advantage and assists in achieving global success. We recognize that it is essential that our work force makeup reflects both the marketplace and our customers. To achieve our diversity goals, we do not tolerate discrimination or devaluing behavior under any circumstance.

Our diversity strategy is based on three guiding principles:

- Integration of diversity concepts into other change processes in the corporation. Key stakeholders, such as suppliers and our dealers, are also encouraged to support our diversity efforts. For example, all GM University (GMU) courses now begin with a diversity protocol, which includes a review of diversity supportive behavior or a videotape that emphasizes inclusive behavior. GMU is a perfect venue to spread the diversity message where appropriate through the many courses offered to employees, covering everything from ergonomics to economics.
- Creation of a "one company" experience for all employees where, regardless of diversity dimensions such as race, age and gender, employees should experience "one GM."
- Approaching diversity with "Big and Fast" in mind. Our Diversity Initiatives process aims to use the size of our company to improve the speed with which decisions are made and change is implemented, consistent with our corporate 'GoFast!' strategy. Diversity Initiatives asks senior teams in business units to address diversity gaps with their own teams and commit to immediate change. This encourages employees to hold themselves and each other accountable for action and to behave in a manner that will contribute to our mutual success.

## Diversity Initiatives

Throughout GM, Diversity Initiatives is the process of creating and maintaining an environment that naturally enables our employees, dealers, suppliers and communities to achieve their fullest potential.

Diversity Initiatives made enormous strides in 2001 with a number of changes and improvements. With a new look, due to the development and marketing of a brand for diversity, Diversity Initiatives is fast becoming a very recognizable part of the corporation.

With the introduction of an additional core value - Individual Respect and Responsibility - our goal in 2001 was to further integrate Diversity Initiatives into the company and to engage with management. Throughout 2002, Diversity Initiatives is also focusing on mass media. Additionally, the "You Make A Difference" Award has been introduced in an effort to support the newly developed sixth core value and reward any employee at any level who takes action that supports or values diversity in the work environment. The "You Make a Difference" Award is now circulating throughout the corporation and is in popular demand.

#### Equal Opportunities, Recruitment and Retention

Our greatest asset is the quality and capabilities of our diverse work force. We strive to attract, retain, develop, nurture, and advance our work force and aim to provide a supportive employee environment, respectful and understanding of people's differences. We believe in fostering an environment that offers the greatest opportunity for everyone, helping to make us an "employer of choice" among an increasingly educated and diverse population and helping us to hold onto our existing workforce.

Employment decisions are based solely on the match of a candidate's qualifications with the organization's requirements. We do not make employment decisions, or place employment related advertisements, on non-job-related criteria such as age, race, sexual orientation, color, gender, religion, or national origin.

We remain committed to Affirmative Action as required by U.S. federal law. As such, we monitor our programs to determine whether recruitment, hiring and other personnel practices are operating in a nondiscriminatory manner. This process includes outreach programs designed to identify qualified individuals of any race or gender who we would not normally access. All managers are expected to meet or exceed diversity goals set through the Affirmative Action Program. Executive representation goals have been set for each of our business sectors. We expect to fully meet all of our targets.

#### Integration Systems

Diversity in the workplace and in our business relationships helps enhance our effectiveness in the global marketplace. To achieve our diversity goals, we do not tolerate discrimination or devaluing behavior under any circumstance.

While we continue our commitment to affirmative action, we are simultaneously widening the diversity agenda and moving toward the broader concept of managing diversity. Our aim is no longer to simply satisfy legal requirements, we are creating an employee environment that optimizes the performance of every employee in pursuit of their business objectives. Additionally, Jack Smith states, "Having people of different ethnic, racial, and social backgrounds in our corporation has not slowed our pursuit of excellence — it has accelerated it."

#### Supplier Diversity

As a national leader and the first automaker to establish a minority supplier development program, we have been at the forefront of minority business development for almost 35 years. Our comprehensive commitment to the development of minority suppliers includes mentoring of 51 minority suppliers, technical and managerial assistance, financing, and other developmental support.



In 2001, we spent \$4.4 billion (\$2.5 billion Tier 1 and \$1.9 billion) with more than 600 minority suppliers. Additionally, 12 minority suppliers were awarded the prestigious GM "Supplier of the Year" award in 2001.

#### Dealer Diversity

For nearly three decades, we have been committed to growing a diverse and financially successful dealer network. We were the first U. S. automaker to institute a structured minority dealer initiative in the industry.

Since 1972, we have provided industry-leading training opportunities to qualified minorities to help prepare them to become future dealers and to help them succeed once they become dealers. we have increased the number of minority-owned dealerships to the highest number since the program began. Today, of our 380 minority dealers, nearly 70 percent own their dealerships outright.

We have dramatically improved the quality of dealership opportunities. The selection process for identifying new dealerships has been standardized, and factors such as size, location, demographics, complexity of operations and investment are considered when matching candidates to dealerships. The result is that new minority-owned dealerships are more profitable than ever before.

The result is a "win-win" combination for everyone because managing dealer diversity increases opportunities for others while strengthening our competitive global advantage.

## SOCIAL INFORMATION

*Community:*

## Community involvement

Through the funding of the GM Foundation and corporate contributions, we support many philanthropic causes. This support comes in the form of cash contributions, as well as in-kind donations and participation in various charity events. Contributions are allocated according to our Philanthropic Mission Statement, which is outlined at right.

We believe that it is essential to invest in organizations and projects dedicated to improving cultural, economic, educational, environmental and social aspects of the communities where we operate.

## Philanthropic Initiatives

Our economic success is inextricably linked with the health and vitality of the communities where we operate. Our largest community economic impacts result from our decisions about plant sites, employment levels and supplier selection. We pay taxes to support important public services and investments. We also contribute to community life through philanthropic contributions and volunteer efforts.

We are at the forefront of applying modern technology to philanthropy. For example, we have implemented an electronic pledge process to capture employee contributions through payroll deductions via the GM / UAW Charitable Contributions Campaign. Our North American employees are now able to make direct payroll contributions to the United Way and other not-for-profit organizations, such as The Nature Conservancy and Mothers Against Drunk Driving (MADD). This project was a joint effort between affiliated trade unions and GM. Throughout the charitable community, this project has been recognized as a innovative example of "high tech / high touch" philanthropy.

## Civic and Community Support

Together with the GM Foundation, we support a variety of activities in the communities where we operate and sell our products. Our philanthropic and community relations mission is designed to ensure that we maintain our leadership position as a valued and responsible corporate citizen. We achieve this by enhancing the quality of life in the communities where we do business, consistent with our business goals and objectives. Our support is centered on linking financial contributions with volunteer efforts, academic research partnerships, marketing sponsorships and memberships.

The GM Foundation also supports organizations that strengthen community awareness and improvement. Together with our employees, retirees and dealers, we make a top priority of responding to the needs of the communities where we live and work, both in times of crisis and on a daily basis. In communities throughout the world we are committed to serving the public interest through contributions of cash, products and that most precious of resources, personal volunteering time. In 2001, the combined contributions from the GM Foundation and GM totaled almost \$8 million for civic and community efforts.

The GM Foundation supports many plant city activities. These initiatives have helped to establish us as a preferred employer, and have helped facilitate awareness of local governmental and community matters. Some of the more unique initiatives that we have undertaken in 2001 are listed below:

#### Give Kids the World (GKTW)

Since 2000, we have partnered with Give Kids the World (GKTW), a magical village based in Orlando, Florida, and Paris, France. The village was initially created for children with life-threatening illnesses and their families to experience the wonder of Disney World and other Central Florida locations. Our locations throughout the world have embraced this concept at both the GKTW villages in Orlando and Paris, with participation in 2001 including the GM Ellesmere Plant in England and locations in Australia.

#### Habitat for Humanity

GM and GMAC sponsored a Habitat for Humanity project in Gliwice, Poland. In addition to providing funds to cover the cost of the home being built, employees from our local Polish units of GM and GMAC, Opel Polska and Opel Bank, volunteered their time to help with the construction.

#### Employee Volunteerism

We actively encourage and support employee volunteerism. A number of initiatives are currently in place, which encourage our employees to donate their personal time and reward them for doing so.

#### GM Volunteer PLU\$

Launched in 1999, GM Volunteer PLU\$ enables employees in the United States to direct a monetary gift from the GM Foundation to local charities where they regularly participate as volunteers. The program is now being expanded globally and in 2001 international pilots were conducted in Colombia and China. We will be communicating this initiative to our units across the globe.

In 2001, more than 1,000 employees were recognized and rewarded for the time they spent volunteering with charities in their community. Contributions directed from the GM Foundation to the charities totaled \$257,000, and we aim to increase this figure by expanding the program to include volunteer teams.

#### National SAFE KIDS Campaign ®

SAFE KIDS BUCKLE UP (SKBU), the nation's leading private sector child passenger safety program, is a multi-million dollar program that began in 1996. This program is a partnership among the UAW-GM Center for Human Resources, GM, and National SAFE KIDS Campaign.

Since 1996, more than \$25 million has been donated to the SKBU program to address the crucial issue of child passenger safety. The SKBU program has checked more than 274,000 child safety seats in communities across the U.S.

In addition to checking child safety seats, the SKBU program has held more than 7,600 child safety seat checkup events, donated more than 250,000 child safety seats, and sponsored over 700 GM dealership education workshops.

In 2001, together with the UAW, we recommitted our support of SKBU by agreeing to fund child safety seat donations for low-income families and at-risk children and establishing 30 new permanent child safety seat inspections stations.

In another important element in the recommitment, in April 2002, GM and the UAW donated 30 Chevrolet Express vans to local SAFE KIDS coalitions across the nation. The new Chevrolet Express vans joined 51 Chevrolet Venture vans donated by GM in 1999, to establish the nation's first-ever fleet of mobile car seat checkup vans -- one for each state and the District of Columbia. The fleet of SKBU Venture and Express vans are fully equipped with everything needed to hold a traveling child safety seat checkup event, including tents, traffic safety cones, and signage.

SKBU also provides bilingual educational materials, a public service campaign, a toll-free hotline (800-441-1888) and millions of dollars in local grants to allow SAFE KIDS coalitions to take this most important service to the public. Additional child safety seats have been donated to families in need through a distribution program with the National Association for the Advancement of Colored People (NAACP) and the National Council of La Raza.

#### Mothers Against Drunk Driving (MADD)

We are continuing our efforts to help rid America's highways of drunken drivers — the leading cause of traffic fatalities — through a multi-year commitment to Mothers Against Drunk Driving (MADD). Corporate sponsorship of MADD, with a potential \$2.5 million value, helps to underwrite a variety of programs, including a number of projects to support MADD's education efforts directed to young people and to honor MADD's 20th anniversary. In an effort to continually remind our employees about the dangers of drunk driving, the GM Charitable Giving Campaign now includes MADD as a possible payroll deduction selection.

In 2001, Saturn was the national sponsor of the MADD "Tie One On For Safety Red Ribbon Program." Also in 2001, together with Chevrolet, we supported a school outreach program newly initiated by MADD. The program includes multi-media programs directed to elementary and middle/high school students and their families. Chevrolet donated the use of 10 Chevrolet Suburbans for transport of the program materials and presenters. We helped with program financial support.

## SOCIAL INFORMATION

*Community:*

## Outreach &amp; education

We have a long-standing commitment to education and have consistently been a leader in contributions, both intellectual and monetary, to the educational community. We believe that quality education is vital to the future of industry, which depends upon an educated workforce to succeed in an increasingly dynamic, technologically complex and competitive environment. Many of the programs receiving our support are designed to create educational opportunities in science, mathematics, and business.

## Higher Education

We maintain ongoing relationships with universities that are members of our Key Institution Program, comprised of schools that have been selected primarily for the quality of their engineering and business programs. Approximately 80% of our educational contributions are for science and engineering, with much of the remainder supporting business education. We support our Key Institutions with cash grants and equipment donations.

## Pre-College Programs

We are a leader in support of kindergarten through 12th grade education in terms of financial contributions and the dedication of thousands of GM employees and retirees who work as volunteers with local schools. The following are some examples of organizations receiving support through the our pre-college support strategy:

- The Society of Automotive Engineers' World in Motion Program is designed to promote fourth through sixth grade students' interest in science and engineering as it strengthens technical science literacy.
- MATHCOUNTS is a national mathematics competition for middle school students designed to build skills, promote strategic problem solving and sharpen analytical abilities.
- DAPCEP (Detroit-Area Pre-College Engineering Program) is a middle/high school program coordinated with the Detroit Public Schools to motivate and prepare minority students for careers in engineering and science. GM engineers serve as mentors for students who construct a vehicle through the "GM Paper Vehicle Project."

## GM Environment, Energy, and Technology Education

Education is key to engaging youth to participate in the protection of our future. The GM Environment, Energy, and Technology Education Team has developed and integrated a number of K-12 initiatives that educate youth about the environment, energy, and technology. The ultimate goal of this program is to foster enthusiasm about these issues and build long-term relationships with students, educators, and their families built upon enjoyment, trust and respect. These initiatives include:

- In conjunction with Weekly Reader Corp., we have developed an in-school fuel cell education program that is expected to reach nearly 3.5 million middle school students throughout the United States. More...
- DOE National Science Bowl For Middle Schools. In collaboration with the U.S. Department of Energy (DOE) National Science Bowl, we are a sponsor of the middle school Science Bowl. This program encourages student involvement in math and science activities, improves awareness of career options, and provides enrichment and reward for academic science achievement.
- Global Rivers Environmental Education Network (GREEN). We have teamed up with the environmental education organization Earthforce to help youth monitor and protect their local rivers, lakes and streams. Through the Global Rivers Environmental Education Network (GREEN), our facilities partner with neighborhood schools and watershed organizations to study their local watersheds. This program provides the opportunity for our employees to work with young people to help them understand, improve and sustain water resources in their communities. Learn more about GREEN by visiting the Earthforce web site.
- Detroit Newspapers in Education (DNIE). Under the sponsorship of General Motors, the Detroit Free Press Newspapers in Education (DNIE) Program fosters students' enthusiasm of science and environmental conservation. The educational unit, complete with hands-on activities, allows educators throughout Michigan to learn about GM's environmental education while applying fun and educational learning tools to their daily lesson plans.
- GM Environmental Lab. Our Oklahoma City, Oklahoma, facility has donated the alternative fueled Environmental Lab to the Kirkpatrick Science and Air Space Museum at the Omniplex in Oklahoma City.
- For Inspiration and Recognition of Science and Technology (FIRST). We are a FIRST (For inspiration and Recognition of Science and Technology) Foundation sponsor, an organization formed to encourage young people to explore careers in science and technology. By using a competition format similar to sporting events, students learn the fun and excitement that can be found in a technical career.

SOCIAL INFORMATION

## Community:

### Supplier management

Guidelines for employees concerning supplier management are discussed in *Winning With Integrity — Our Values and Guidelines for Employee Conduct*, and in the supplemental booklet *Integrity in the Marketplace*.

In addition, the GM Worldwide Purchasing Policy includes a number of practices that guide us and our suppliers in purchasing activities throughout the world. Our suppliers, and any goods or services supplied, must comply with all applicable regulations or standards of the country(ies) of destination or that relate to the manufacture, labeling, transportation, importation, exportation, licensing, approval or certification of goods or services, including, but not limited to, those relating to environmental matters, wages, hours, conditions of employment, subcontractor selection, discrimination, occupational health and safety, and motor vehicle safety. Additionally, neither suppliers nor their subcontractors may utilize slave, prisoner or any other form of forced or involuntary labor in the supply of goods or provision of services. In order to ensure successful implementation of these policies, suppliers must adhere to the terms and conditions outlined in the GM Purchase Order Terms and Conditions, and must certify their compliance with these terms and conditions at our request.

PRODUCT DESIGN & PERFORMANCE

**“ We believe the automobile can be the pathway to the hydrogen economy and a truly sustainable future. ”**

- Larry Burns,  
Vice President, GM Research and Development and Planning



PRODUCT DESIGN & PERFORMANCE

## *Impact of motor vehicles:*

With such a heavy reliance on motor vehicle transportation around the world, even with today's technologies, the vehicles we produce have an impact on the environment.

Our vehicles and products have been developed to achieve high levels of energy efficiency, very low levels of emissions and high recyclability, while meeting customer expectations in terms of comfort, style, performance, handling and safety. We believe that through our products, and the innovation and technology used to develop them, we can provide transportation that improves peoples lives around the world.

## PRODUCT DESIGN &amp; PERFORMANCE

*Meeting customer demands:*

The rate of innovation and change within the motor vehicle industry is accelerating. This is driven partly by changing customer needs. Customers are ever more demanding in what they expect from their vehicle and how it meets their needs. Our customers however are not the only agents behind change. New technology allows designers to challenge every aspect of car design, from styling through body construction. Intense industry competition, has led to a search for new winning vehicle concepts, resulting in the development of new vehicle segments and hybrid vehicles. Further legal and regulatory requirements for new products add to the picture of a rapidly changing industry.

## Product Design

Meeting customer demands in a dynamic market place is not just a question of developing an acute understanding of current customer needs and designing vehicles to meet them. It is also essential to identify future customer needs and requirements as well as trends in style and taste. This is particularly important in the motor vehicle industry.

## Vehicle Quality

In 2001, we again showed improvement in respected independent studies of productivity and quality. In the 2001 Harbour Report, our productivity improvement outpaced all other multi-plant manufacturers in North America. We also scored the largest gain of any full-line automaker in the 2001 J.D. Power and Associates Initial Quality Study, putting us ahead of all U.S. automakers and in the industry's top ranks.

## Product Portfolio Implications

Customer enthusiasm is central to our corporate vision. Producing the right range of products, our Product Portfolio, is key to developing enthusiastic customers. In fact, as a direct consequence of the collective effect of our customers' individual purchase decisions, it is our customers who ultimately determine the type and number of products that we produce.

The product portfolio determines when, where, and how much of a given product is produced. Supporting this production is a manufacturing portfolio of facilities. Changes in consumer preferences eventually impact the Manufacturing Portfolio and drives decisions regarding the location of facilities including openings, closings, expansions and contractions.

We analyze a variety of factors to predict future customer needs and requirements including: sales experience, customer feedback, market research, competitive market analysis, option portfolio development, auto shows and economic trend analysis. Our products must also address additional requirements including: occupant safety, fuel economy, vehicle emissions, serviceability, affordability, and manufacturability. Our planners use this information to develop a multi-year product portfolio strategy to balance the customer's needs with the product requirements mentioned above. Our Automotive Strategy Board is responsible for approving the final product portfolio strategy.

## PRODUCT DESIGN &amp; PERFORMANCE

*Product safety:***Safety**

Motor vehicle crashes represent a significant public health challenge. In industrialized nations, motor vehicle crashes are often one of the most frequent causes of accidental death and injury. In developing economies, infrastructure limitations and uncontrolled traffic mix create the potential for high crash injury/fatality involvement rates. The science of motor vehicle safety is a search for:

1. understanding the nature of the public health challenge -- in magnitude and by problem type;
2. prioritization of specific problem types as a function of societal harm -- the human and economic cost consequent to collision injury; and
3. the invention, development, and implementation of effective countermeasures intended to intervene in the specific sequence of events that conjoin to cause motor vehicle-related injury.

This science has been subject to scholarly research for multiple decades. GM is proud to have been synonymous with research, development, engineering design, product innovation, and public policy initiatives to improve motor vehicle safety and reduce the societal harm occasioned by vehicle collisions.

The conceptual tools of motor vehicle safety are well developed and widely applied. They are fundamentally based upon a shared understanding among government, industry, academics, and respected non-government organizations (NGOs) concerning the potential causes of motor vehicle crash injury and the scientific data that can be used to characterize, qualify, or quantify specific problems -- real world collision data. Based on U.S. government research, we know the fundamental cause of most collisions is due to a failure in driver behavior. While there is potential for harm reduction in improved vehicle performance in collision avoidance (to reduce the likelihood of a collision) and crashworthiness (to reduce this likelihood of injury given a crash occurrence), the most significant opportunities for societal harm reduction call for improvements in driver behavior. GM approaches these problems through partnerships with responsible NGOs with shared values and objectives. In this way, GM leverages its global presence to effect public policy initiatives aimed at reducing motor vehicle collision-related harm through improved driver or user behaviors.

Our aim is to improve motor vehicle safety for customers and other roadway users. For many consumers, motor vehicle safety is a basic threshold when considering a vehicle for purchase. Our customers expect and demand vehicles that help them to avoid crashes and reduce the risk of injury when involved in crashes. We strive to exceed these expectations and, thereby, protect customers and their families while they are on the road.

Motor vehicle safety is a function of the design of the vehicle, the manner in which it is operated, and the environment in which it is driven. We are committed to research and to the implementation of programs and technologies that enhance the safety of other occupants by assisting drivers in the operation of their vehicle in avoiding hazards, and helping to protect occupants in the event of a vehicle crash. We support public policy initiatives that encourage drivers and other vehicle occupants to take actions that help assure their safety when driving.

Our motor vehicle safety priorities are guided by analysis of "real world" safety, that is, the experience of our vehicles on the road in actual customer use. An understanding of injury risk and potential ways to reduce it are the main factors guiding us in setting safety policies, undertaking advanced safety research, and implementing product safety systems, features, and public policy programs. Our public policy positions and partnerships are founded on a commitment to encourage governments and policy leaders to pursue safety policies and initiatives that are based on science and the real world potential to reduce societal harm.

## PRODUCT DESIGN &amp; PERFORMANCE

*Product safety:*

## Safety technologies

Compared with the potential harm reductions associated with driver / use behavior improvements, the potential harm reductions now available through application of new vehicle-based strategies are relatively modest. However, vehicle-based solutions can be affected by manufacturers and so become important elements in manufacturers' contributions to injury control. Vehicle-based strategies for injury control fall into two categories:

- collision avoidance — technologies that assist road user in avoiding potential crashes (sometimes called "active safety" technologies) and
- crashworthiness — technologies intended to mitigate the injury potential of a crash (some times called "passive safety").

As with all motor vehicle safety issues, consideration of vehicle-based safety improvement technologies begins with a risk assessment of real world collision data to quantify exposure, to identify potential intervening countermeasures, to evaluate potential design alternatives, and to characterize potential effectiveness measures in reducing societal harm. All new product programs begin with an assessment of current product collision involvement and outcomes based on real world collision data. We strive to make each new model safer than the model it replaces.

Motor vehicle crash avoidance and crashworthiness are complex issues far too involved for comprehensive treatment here. Following is a very brief and high-level overview of these two subjects with descriptions of only a few applicable principles and selected technologies. There are many more considerations and technologies than can be covered in a forum such as this. Additionally, in application, considerations may need to be balanced, as technologies that advantage some occupant populations can disadvantage others. Thus, good engineering judgment is called upon to weigh such mutually exclusive design features so as to provide operational systems that are optimized over the entire occupant population. Such decisions can involve value judgments.

## Crashworthiness

Vehicle crashworthiness is measured by real world collision data in risk analysis, an assessment of the likelihood of injury given a collision. Crashworthiness function is provided by optimized vehicle structure and by vehicle restraint technologies.

In every collision event, the kinetic energy of the motor vehicle (a function of the vehicle mass and travel velocity) must be dissipated. Energy is dissipated by the action of collision forces in deformation of the vehicle structure or by collision-related friction forces at the vehicle - ground contact points (usually the tires). In either case, structural performance dictates the vehicle response. It is the overall vehicle response to collision forces that strongly influences the collision-related forces to which the occupants are subject. It is these forces (in conjunction with human tolerance levels) that dictate occupant injury outcomes.

*The "Second Collision" and Occupant Injury Potential*

The classic techniques of motor vehicle safety and injury control consider two collision events. The first collision is that between the vehicle and another object during which the vehicle's kinetic energy is dissipated. The so called "second collision" is that between the occupant and the vehicle's interior or other external objects. During this "second collision," most of the kinetic energy of the occupant must be dissipated. At the most basic level, the occupant's kinetic energy is dissipated by collision forces acting on the occupant's body over some distance. If the collision forces acting upon the occupant exceed the occupant's tolerance limit to those forces, injury will result. Injury severity is generally a function of the level, and, in some cases, the duration and/or application rate of the forces applied in the "second collision" matched to the tolerance limit of the individual occupants. Interior systems are engineered to manage these second collision forces as well as possible.

Injury can also be produced in a crushing or trapping mechanism to excessive intrusion of the basic vehicle structure. Of course, this creates a dilemma. Structural deformation is necessary to dissipate the kinetic energy of the vehicle during the collision. At some point, however, deformation of the structure can result in intrusion or trapping injury to occupants and, ultimately, there are possible collision conditions that will overload the force / deformation capacity of the structure with consequent occupant injury highly likely.

*Vehicle Structure*

Vehicle structure is optimized for energy absorption capacity, occupant compartment integrity, mass efficiency, functional performance in non-safety-related domains (such as durability, noise transmission, vibration response), physical geometry, load carrying capacity, and manufacturing practicality. Sound vehicle structures provide the foundation upon which vehicle subsystems — including all safety systems — can be mounted to produce a fully functional, fully integrated motor vehicle product.

*Interior Energy Absorbing Functions*

Many interior surfaces are designed to absorb energy by deforming under collision forces produced by the occupant "second collision," such as glazing, headliners, roof structures, instrument panels, steering columns, door trim, etc.

*Child Restraint Systems*

In the mid 1990s, GM and partners conducted research on universal attachment systems for child restraints. The results of the research were shared with government, restraint system suppliers, and other auto manufacturers as part of their participation in the International Standards Organization (ISO) committee developing universal child restraint anchorages. All of our vehicles manufactured for sale in the U.S. and Canada are equipped with the top tether and lower anchorage components in the Lower Anchorages and Top tethers for Children (LATCH) system, which helps secure the child restraint to the vehicle. In the U.S. and throughout global markets, an integral child restraint for toddlers is available on some of our vehicles that are popular with families. The integral seat addresses a concern of parents: properly installing and positioning the child restraint in the vehicle (although parents must still assure that the child is properly secured in the integral child restraint).

GM provides rear seat shoulder belt comfort guides. Elastic tethers attached to the safety belts in rear outboard seating positions move the torso part of the shoulder/safety belt away from the neck to help improve comfort for children too large for booster seats and other diminutive occupants.

*Advanced Restraint Systems*

Advanced restraint systems incorporate multiple technologies and features; some are discussed below. Many of GM's vehicles incorporate these advanced features.

*Depowered Air Bags:* In 1997, the National Traffic Safety Administration affirmatively responded to research and proposals that GM made to revise safety standards and improve air bag safety. For the 1998 model year, GM reduced air bag inflation authority consistent with the new rule. All subsequent GM frontal collision air bags have been engineered at these inflation authority levels.

*Dual Stage Air Bags:* Provide two levels of inflation authority tailored to collision severity. The system helps to reduce the risk of air bag-related injuries in moderate to severe crashes when full force air bags may not be necessary to supplement the safety belt system. The dual level system inflates with a higher or lower pressure, depending upon crash severity and possibly, occupant proximity to the air bag module. The system helps to reduce the risk of air bag-related injury for some front seat occupants who fail to buckle seat belts.

*Seat Belt Force Limiting Devices:* In belt webbing or retractor mechanisms to control belt forces on the occupants.

*Seat Belt Pretensioners:* Couple the occupant to the vehicle and provide a longer duration for deceleration of the occupant.

*Side Impact Air Bags:* Optional on many GM vehicles. Provide additional energy-absorbing capability for side impact. Some are designed to provide protection for the head in side collisions. All of GM's side impact air bags systems have been designed to be safe for children. With the assistance of the Insurance Institute for Highway Safety and U.S. and Canadian government officials, GM's internal design guidelines for child-tolerant side impact air bags have been extended by an industry technical working group and have been adopted as a voluntary industry standard by members of the Alliance of Automobile Manufacturers.

*Roof Rail Air Bags:* Provide side impact head protection for front and second seating row occupants.

In fall 2001, Opel and Vauxhall in Europe made another significant addition to the comprehensive safety package in the current range by installing state-of-the-art, full-size curtain air bags on both sides of the vehicle providing front and rear passengers with further protection in the event of a collision at the side of the vehicle. Developed by safety engineers at GME's International Technical Development Center (ITDC), these air bags, with a volume of around 25 liters, inflate like a curtain along the side window area within 25 to 30 milliseconds. They thus cushion the heads of the occupants from the effects of a lateral impact and significantly reduce the risk of injury. The full-size curtain air bags will initially be available for the Corsa, Astra and Zafira, with other models following later.

The full-size curtain air bags considerably reduce the force of the impact on the passengers, especially if the side of the vehicle collides with a post or tree. In tests carried out according to criteria set by independent safety assessors, the car is propelled sideways at 29 km/h into a rigid pole. Under these impact conditions, the risk of head injury is reduced by around 90%.

Saturn was the first vehicle in the U.S. small car segment to introduce a side impact head curtain.

*Seats and Head Restraints:* Seat backs must be rigid enough to contain occupants in rear collisions, deformable enough to absorb collision energy, and head restraints must be geometrically placed to limit neck hyperflexion. GM seats are designed to balance all these requirements. Many GM seats have adjustable head restraints with instructions for proper use in GM Owner's Manuals.

*Passenger Sensing System (PSS):* An advanced passenger air bag suppression system will be introduced on 2003 model year large-size sport utility vehicles and pickup trucks. The system is designed to determine whether the right front passenger air bag should deploy in a frontal crash. We will be first to market with this system, which is fully compliant with the U.S. advanced air bag standards.

## Crash Avoidance

Crash avoidance technologies are intended to assist road users to avoid potential collisions under various adverse environmental or operating conditions (e.g., lighting conditions, limit handling, or braking).

### *Daytime Running Lamps (DRLs)*

Daytime Running Lamps (DRLs) increase vehicle conspicuity in adverse daytime lighting conditions and are intended to notify road users of the presence of vehicles that may not otherwise be easily visible. Based on experience in some European countries and Canada, GM petitioned the National Highway Traffic Safety Administration (NHTSA) for rulemaking to enable DRLs in the U.S. NHTSA granted GM's petition in 1993. In 1995, GM started installing DRLs as standard equipment on some vehicles in the U.S. and, by 1997, all new GM vehicles were delivered with DRLs as standard equipment. Some other manufactures have followed and now offer DRLs as standard equipment on U.S. vehicles.

Risk analysis or real world collision data show that DRLs reduce the relevant daytime collision by about 5% and urban pedestrian collisions by about 9%. Based on this risk analysis, GM has petitioned NHTSA to require DRLs on the entire new vehicle U.S. fleet..

### *Vehicle Handling Systems*

Vehicle Stability Enhancement Systems (VSES) help drivers maintain control at limit handling conditions. We offer the system across our brands using several names: StabiliTrak, Precision Control, and Active Traction.

VSES helps the driver maintain vehicle control in sudden maneuvers, particularly in low traction conditions, in emergency lane changes, and during collision avoidance actions. The system works by recognizing wheel-skid. Sensors detect the difference between steering wheel angle and the direction the driver is actually turning by "reading" the steering wheel position, the amount of sideways force in play, and the vehicle's response to steering wheel input. The system then uses the brakes to enhance control of the vehicle's direction and to help keep the vehicle on course. It automatically reduces the engine torque and applies precise amounts of pressure to front right or left brakes to help keep the vehicle "on track."

Additional vehicle control systems help drivers in challenging driving conditions. Traction Control helps drivers maintain traction when accelerating on wet or snow-covered roads. The system automatically applies brake pressure and reduces engine power when sensors detect wheel slippage.



Magnasteer uses an electronically controlled magnetic field to continually adjust the effort a driver feels when steering as a function of vehicle speed. The system helps provide ease for drivers while parking, yet enables the driver to retain a firm, solid feel at highway speeds.

#### *Tire Pressure Monitoring System (TPMS)*

Helping consumers with tire safety has been one of our priorities for many years. As early as 1987, we began equipping some vehicles with tire pressure monitors. Currently, more than two million of our cars are equipped with tire pressure monitors - more than any other manufacturer.

GM vehicles that have the ability to monitor tire pressure using either the antilock brake system (ABS) or separate sensors mounted in each wheel. A warning light on the instrument panel or message displayed on the driver information center, along with an audible warning, alerts the driver to check the air pressure in their tires. An estimated 83% of tire pressure loss occurs gradually — often without being noticed by the driver.

A survey of GM vehicles equipped with TPMS showed significantly better tire pressure levels than in vehicles not so equipped. Proper tire pressure is important to reduce tire wear and to maintain the design level performance characteristics.

#### *Tire Safety*

Tire safety has been an area of research at GM for more than three decades, beginning in 1968 with the opening of our Tire and Wheel Systems Laboratory at the Milford Proving Ground, Michigan. The research lab has enabled us to mount an ongoing effort to ensure the original equipment tires on our vehicles perform safely and effectively, from the time the car or truck is driven off the dealership's lot.

Our focus on tire safety also includes warranty protection, our exclusive Tire Performance Criteria (TPC) system, and an ongoing working relationship with tire suppliers. We cover original equipment tires under our bumper-to-bumper New Vehicle Limited Warranty. Over 25 years ago, we introduced the Tire Performance Criteria (TPC) specification system. The TPC specification number provides information on over a dozen critical performance specifications, and allows us to specifically match tires to the vehicle on which they are installed, and we continually evaluate the performance of tires used on our products.

### Other Technologies and Features

#### *OnStar*

OnStar is a unique blend of cutting-edge technology and attentive personal service that provides an unparalleled level of safety, security, and information. With this innovative service, an OnStar Advisor is available at the touch of a button to contact emergency assistance. In a crash where the air bags deploy, OnStar will automatically send a call for help with the exact location of the car or truck to an OnStar Center, where trained advisors will immediately contact emergency services.

If a vehicle is reported stolen, OnStar will assist the police in attempting to track it.

OnStar uses the Global Positioning System (GPS) satellite network and cellular technology to link vehicle and driver to the OnStar Center, where advisors are available 24 hours a day, 365 days a year.

OnStar is a completely embedded system that relies on voice recognition and audio-based services and content. There are no screens or displays.

GM and OnStar have an ongoing commitment to motor vehicle safety. In line with this we have developed common-sense principles to help guide how information delivery systems are designed into our vehicles. The goal is to design systems that limit unnecessary or excessive attention demands on the driver while driving.

Currently, OnStar is active on about 2 million vehicles. Most of GM's 54 U.S. models will offer OnStar as either standard equipment or as part of a preferred equipment package.

#### *Trunk Anti-Entrapment Technologies*

Our commitment to motor vehicle safety goes beyond crashworthiness and crash avoidance. We responded quickly to a cluster of child trunk entrapments. In only 17 weeks, with help from the National SAFE KIDS Campaign, we developed a child resistant trunk retrofit kit, which was safely tested by children.

#### *Parking Aids*

Two new systems fitted on selected vehicles help drivers avoid collisions with objects while moving in reverse at very slow speeds. The Ultrasonic Rear Parking Assist helps warn drivers of stationary obstacles behind the vehicle. The system uses visual and audible methods to alert the driver of objects up to five feet behind the vehicle when the vehicle is moving at or below speeds of 3 mph.

The Parallel Park Assist Mirror helps drivers who are operating a vehicle in reverse. The feature tilts the passenger side outside rear-view mirror down to provide a curb view whenever the driver places the vehicle in reverse. When the vehicle is shifted out of reverse, the passenger side mirror returns to its original position.

#### *Crash Response*

SAAB, our Swedish subsidiary, has developed a unique command car capable of fast communications with units that are involved when major accidents and disasters occur. The car is being used by emergency services in the West Götaland Region of Sweden.

The new command car, a converted and specially equipped red SAAB 9-5, is the most advanced mobile liaison center to be found anywhere in Sweden. Its base is the West Götaland Region's emergency unit, where experienced doctors and nurses specially trained to deal with disasters and to mount major medical operations are available round the clock, all the year round.

The command car has ordinary two-way radio, communication radio on the VHF band, GSM and NMT 450 mobile telephony, portable radio, computers, GPS-based map-reading support and navigational systems. The car can be integrated into wireless networks, communicating with ambulances on the scene of the disaster. The screen of the navigational system can also be used as a television for monitoring the media. The command car can be transported by a Swedish Air Force Hercules to a disaster site where the command function needs reinforcement. Extra eyebolts have been welded onto the car so that it can easily be lashed down in the aircraft. It also has a connection point to take an external power supply, so that its equipment will work during the flight as well.

PRODUCT DESIGN & PERFORMANCE

## *Design for environment:*

### Design process

Environmental and recycling requirements are put into technical specifications for all future vehicles. A common global template is used to establish these requirements regardless of where we develop the vehicle. The requirements are then tracked as a vehicle is designed to make sure they are achieved. The requirements include specifying vehicle recyclability and recoverability, use of recycled materials, compliance with restricted and reportable materials requirements and end-of-life vehicle treatment.

In meeting these requirements, design engineers continue to use the specifications on recycling as well as restricted and reportable materials tools.

In addition we provide design guidance for materials, processes and non-product output for facilities. Materials and processes are reviewed for environmental impact through the Productive Material Review Process (PMRV) and the Manufacturing Planning Study Process (MPS). These review tools are used to work forward in the development process to design in good environmental processes, procedures and equipment to global specifications. As a support for these processes DfE utilizes tools such as Life Cycle Analysis and DfE Assessments to determine the best fit solutions. We are actively working with our suppliers to teach and integrate lean environmental principles for them to use for their own business decisions through the "Greening the Supply Chain" and the "Supplier Partnership for the Environment" initiatives.

## PRODUCT DESIGN &amp; PERFORMANCE

*Design for environment:*

## Product life cycle

We are committed to reducing waste and pollutants, conserving resources, and using recycled materials at every stage of the product life cycle. The embodiment of life cycle thinking in the design, manufacture, use, and disposal of our vehicles continues to grow and positively affect product programs. Life cycle assessment provides the information base on which to balance the environmental, social, and economic consequences of decisions.

Environmental impact can take many forms and must be considered as part of the total life cycle of the product, including material production, manufacturing process, use phase and end of life/disposal.

Our Design for the Environment (DFE) Group tracks the environmental improvements for each new vehicle program. An environmental feature is considered to be any improvement that has lessened the effect of our product on the environment. This includes any part of the product life cycle such as reducing mass, eliminating scrap, designing parts for easy disassembly, avoiding hazardous material usage, longer life parts and the use of recycled or reprocessed materials.

DFE initiatives continue to be developed for our new product programs. The goal of these initiatives is to optimize the environmental performance of the vehicle. DFE engineers are assigned by platform to assist vehicle teams. Life cycle tools have been developed for the teams to use.

Click for information on specific design for environment activities in North America.

*"A design that's right first time is the key to the minimum possible environmental impact during the entire life-cycle of the product. This influences the entire chain from development and production, up to regular use and recycling. Moreover, environmental thinking cuts costs and improves efficient use of resources in the company."*

— Lars Olsson, SAAB Technical Development Department

## Life Cycle Analysis

To better utilize our life cycle analysis capabilities, a global life cycle analysis subcommittee was formed. GaBi 3 Professional was adopted as a common software tool for life cycle analysis studies and to utilize the world's largest database of life cycle inventory data related to the automotive industry. At Opel, internal studies are joint projects with Advanced Engineering, Product Engineering, and Powertrain. One study compared magnesium and steel as materials for the Cross Car Beam. The life cycle for an entire vehicle was done on the Astra G. In North America, studies have been completed on aluminum casting, painting, and fuel cell components. For example, an entire vehicle was analyzed through USCAR.

## PRODUCT DESIGN &amp; PERFORMANCE

*Design for environment:*

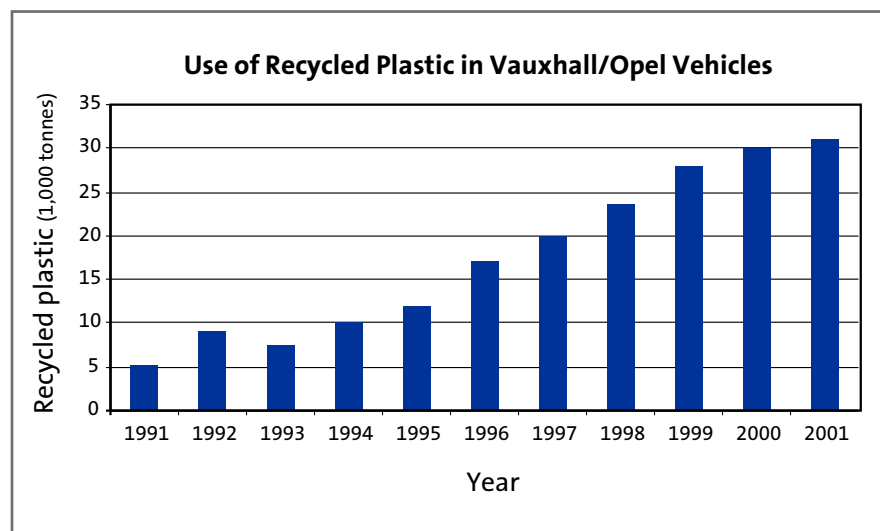
## Choosing the right materials

Choosing the right materials is vital to gain both maximum quality and to protect the environment. Designers are required to seek materials that are non-toxic, take account of renewable resources, increase the percentage of recyclable materials and give preference to recycled goods over virgin materials. Over the last decade, for example, our European subsidiaries have been progressively increasing the content of recycled plastics in their vehicles. During 2001, more than 30,000 tons of recycled materials were incorporated in new Vauxhall and Opel vehicles, six times more than in 1991. Over the last decade, we have been progressively increasing the content of recycled plastic in our vehicles.

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Materials recommended for use in our products and manufacturing processes are assessed prior to approval for potential health and environmental impacts. This occurs through the utilization of two complementary processes. Materials selected to be used in our products are assessed through the Productive Materials Review Process (PMRV), which supports the release and material engineering community and is part of the Design for the Environment process. If a material is approved through this process, the information is then sent to the plant Hazardous Materials Control Committee (HMCC) the second process, for local review and implementation. The HMCC assesses the potential health and environmental impacts of those materials that support the manufacturing processes (indirect materials), but do not actually become part of our products.

The PMRV team continues to provide critical support for the assessments of the materials proposed for use at GM facilities. Timely review and communication with the design and release engineers and local HMCCs assist plants in meeting material needs. For example, assessments of sealers at Flint Truck resulted in significant improvement of sealer performance while reducing potential health and environmental concerns. The timeliness of the reviews ensures a smooth transition for all new production systems.

Various complementary environmental information systems and guides are used in product development to provide the relevant information and ideas for environmentally-responsible product design. Product specifications list external and internal requirements with references to further data sources. The "Global Legal Database," developed by ITDC and available online throughout the company, contains detailed information on currently applicable and known future product regulatory requirements around the world. Internal specifications such as the "GMW3059 Restricted and Reportable Substances for Parts Specification" provide both engineers and suppliers with information on material inputs, which are either prohibited, or subject to declaration requirements.

## PRODUCT DESIGN &amp; PERFORMANCE

*Design for environment:*

## Reducing exhaust emissions

There are two main traditional concerns about exhaust emissions. First, there can be environmental and health impacts from emissions such as nitrogen oxides (NOx), particulates, unburned hydrocarbons (HC) and carbon monoxide (CO). Secondly, there is concern about the emissions of greenhouse gases, mainly carbon dioxide (CO<sub>2</sub>), which is non-toxic.

Since the mid-1960s, vehicle tailpipe emissions of hydrocarbons (HC), carbon monoxide (CO), and oxides of nitrogen (NOx) have significantly decreased. In the United States and Canada, HC, CO, and NOx of passenger cars have decreased by 99%, 96%, and 95%, respectively, (see below). We are achieving these reductions by producing Low Emission Vehicles (LEVs) for sale throughout the United States and Canada as part of the National Low Emission Vehicle (NLEV) Program that we initiated.

As with the U.S., Europe has come a long way in reducing exhaust emissions. When the latest Euro 4 standards come into force in 2005, emission levels of carbon monoxide (CO) and combined emissions of hydrocarbons and nitrogen oxides (HC + NOx) will have been reduced by 97% since 1970 when emission standards were first introduced. The most significant reductions have been achieved between 1993 and 2005, with CO emissions reduced by 83%, combined HC + NOx by 69% and particulate matter (PM, from diesel engines) by 82%.

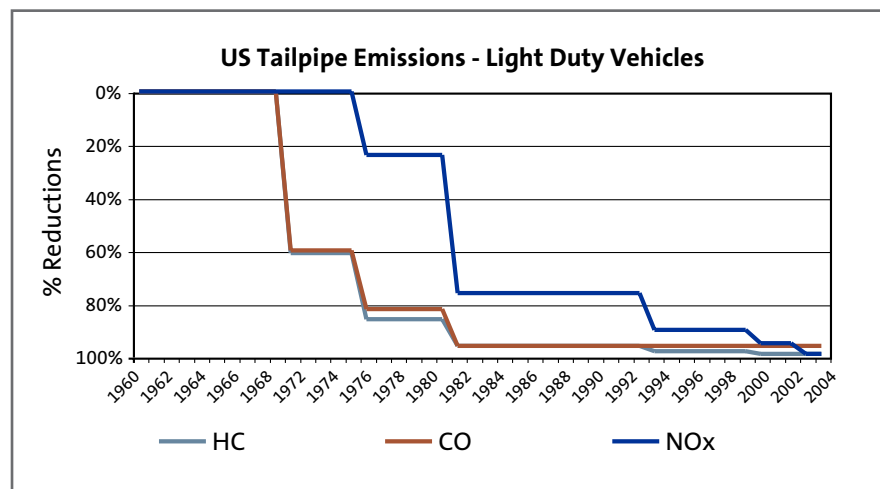
Our commitment to environmental protection was already documented back in 1989, when we became the first automobile manufacturer in Europe to supply all passenger cars with closed-loop, three-way catalytic converter as standard equipment. Since then we have complied with Euro 2, Euro 3 and Euro 4 emissions standards long before they became mandatory law. Today, new gasoline engines of the ECOTEC engine family, which was first introduced in 1993, meet stringent Euro 4 emission standards, which don't come into force until 2005.

## Cleaner fuels mean reduced emissions

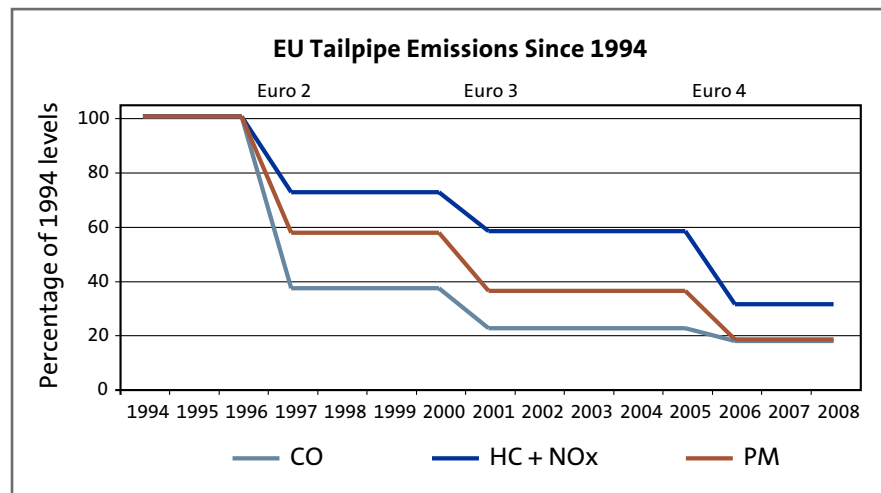
Cleaner fuels are needed to meet the even more stringent Tier 2 and LEV II emissions standards starting in 2004 and to realize the full potential of our powertrain emissions control technologies,

We continue to be an industry leader in moving governments worldwide toward regulations for low-

sulfur and improved quality fuels, both gasoline and diesel. Sulfur in fuel reduces the effectiveness of the three-way catalytic converter even in today's vehicles, and improved fuel quality is essential in meeting the new Tier 2 and LEV II emission standards. For the purpose of speeding the development



of advanced engines and propulsion systems for the future, such as fuel cells, we have formed relationships with leading energy companies including British Petroleum, ExxonMobil, and Shell. Through the joint efforts of these relationships, advanced engine/fuel systems will be developed that will enable us to continue to provide improved vehicle efficiencies and lower emissions while meeting the performance expectations of our customers.





## PRODUCT DESIGN &amp; PERFORMANCE

*Design for environment:*

## Reducing fuel consumption

Greenhouse gas emissions from our vehicles are closely related to the fuel economy of those vehicles. Carbon dioxide (CO<sub>2</sub>), a greenhouse gas, is emitted by the clean combustion of gasoline or diesel fuel in an engine. Greater fuel economy therefore means lower CO<sub>2</sub> emissions.

## Our approach

The new millennium has seen an increase in pressure, both at an industry level (see details of regulatory pressures around the globe), and on ourselves individually, to improve the fuel efficiency of our products and to reduce their impact on the environment. Continued concerns about global warming, volatility in the price of gasoline, and a focus on sport utility vehicles in the U.S. have added to the call for higher fuel economy by the U.S. Congress, environmental groups, media, and others.

We believe that technology and innovation as well as partnerships are required to meet these challenges.

## Technology and Innovation

In terms of technology and innovation, we have near-term and long-term plans for improving both fuel economy and emissions of CO<sub>2</sub>.

In the near-term we will be:

- introducing new and more efficient engines using technologies such as displacement on demand, continuously variable transmission, variable valve timing, electric power steering and innovative vehicle weight savings;
- designing and adapting engines to use alternative fuels, such as ethanol, LPG, CNG, and biofuels;
- introducing hybrids that combine an efficient internal combustion engine with electric motors.

In the long term, our plans include continuing to make the internal combustion engine more efficient, while developing new technology such as the fuel cell. Fuel cells have the potential to reduce CO<sub>2</sub> emissions dramatically when running on fossil fuels — and to nearly eliminate CO<sub>2</sub> emissions when running on hydrogen produced using renewable energy such as wind, solar, biomass and hydro-electricity.

## FUEL EFFICIENT U.S. VEHICLES

- GM's Most Fuel-Efficient Vehicles
- GM's Most Fuel-Efficient 6-cylinder Vehicles
- Most Fuel-Efficient 6-cylinder Vehicles
- GM's Most Fuel-Efficient Cargo Vans
- Most Fuel-Efficient Cargo Vans
- GM's Most Fuel-Efficient Passenger Vans
- Most Fuel-Efficient Passenger Vans
- GM's Most Fuel-Efficient Large Cars
- Most Fuel-Efficient Large Cars
- Most Fuel-Efficient 2WD Minivans

See:

[www.gm.com/company/gmability/environment/products/fuel\\_economy/index.html](http://www.gm.com/company/gmability/environment/products/fuel_economy/index.html)

## Partnerships

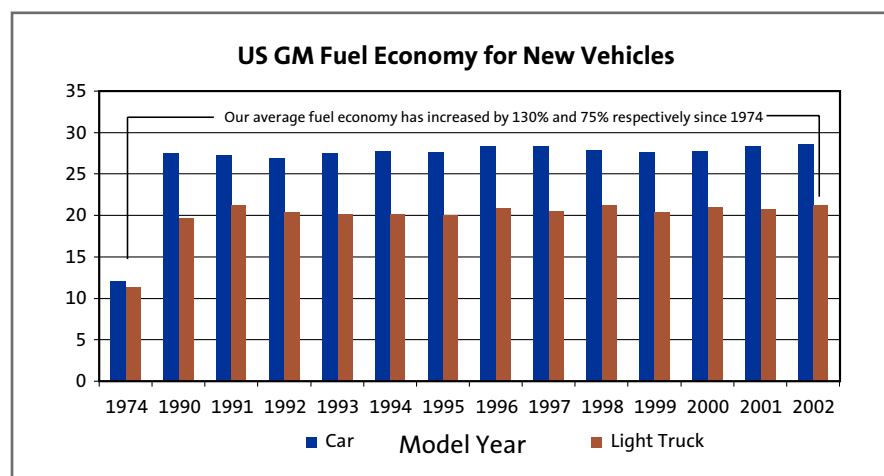
The challenges faced in developing and introducing new break-through technologies — and the infrastructure to support them — are enormous. We believe that the quickest and most effective way to overcome these challenges is to work with others in our industry, with those in associated industries such as energy companies, and with government and society.

Significant resources are being devoted for collaborative research and development programs. We also support partnerships with government including the recently announced FreedomCar project to develop advanced technologies for use in vehicles. Such collaborative programs have resulted, for example, in the 80-mpg hybrid Precept concept vehicle, the announcement of a parallel hybrid full-size truck for 2004, and fuel cell breakthroughs in Europe and the U.S.

## Performance in reducing fuel consumption

## U.S. and Canada

In the United States, the average fuel economy of our new cars and light trucks has increased about 130% and 75%, respectively, since 1974 (see graph below). Since 1990, new vehicle fuel economy has been relatively constant as consumer choice, reflecting increased disposable income and relatively low fuel prices, has not emphasized vehicles with high fuel economy.

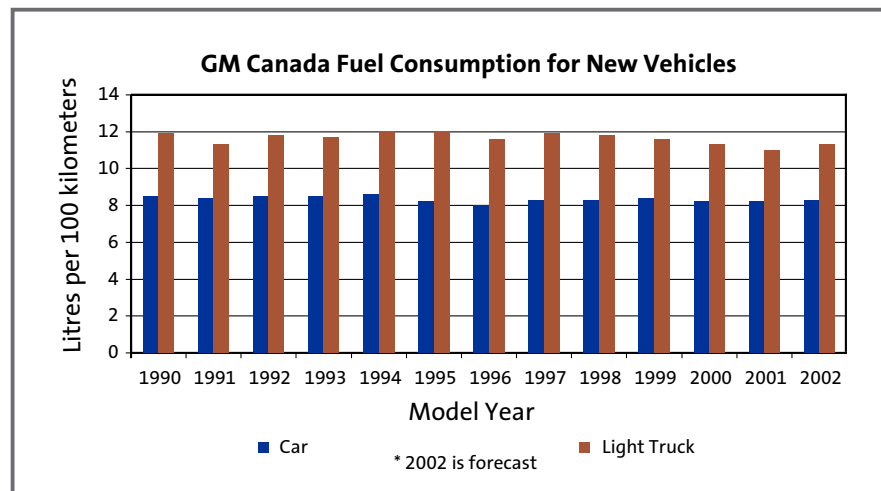


Our 2002 CAFE fleets are meeting the U.S. Corporate Average Fuel Economy (CAFE) standards. Our introduction of fuel economy technology and model improvements have not been fully reflected in our CAFE averages. This is due to these gains being offset by consumer demand for larger vehicles, higher performance, and more features.

In Canada, the fuel consumption (measured in liters per 100 kilometers or L/100 kilometer) of GM's passenger cars and light trucks have followed similar trends as the U.S. fleets. GM Canada's car and truck fleets are meeting their Company Average Fuel Consumption (CAFC) targets of 8.6 L/100 km and 11.4 L/100 km, respectively.

## Europe

With fuel prices in Europe three to four times higher than in the U.S., there is large customer demand for fuel efficiency. GME's goal is to offer automobiles that deliver outstanding efficiency, thereby coupling responsive performance with low fuel consumption.



Despite the introduction of new test procedures in Europe in 1996 and 2000, which resulted in effectively increased fuel consumption figures, GME has been able to reduce fuel consumption by approximately 10% since 1995.

Opel/Vauxhall Corsa Eco: First gasoline powered car in class with fuel consumption below 5 liters per 100 km

Refined aerodynamics and the highly efficient ECOTEC 1.0-liter engine (43 kW/58 hp) combined with the innovative Easytronic transmission are the two key factors that made the Corsa Eco the first gasoline-powered car in its class to break the five-liter barrier, consuming only 4.9 liters per 100 km. The low CO<sub>2</sub> emissions of 118g /km match the standard set by its successful diesel brother, the Astra Eco 4. Launched in April 2002, the Corsa Eco achieves this high fuel economy without making any compromises on comfort, safety or driving enjoyment.

The Opel / Vauxhall Easytronic transmission is an automated manual gearbox with no clutch pedal which leaves it up to the driver to decide whether to adopt an active driving style, changing gears himself, or to relax, leaving the gear changes to the electronic brain of the transmission — and saving fuel at the same time. For the Corsa Eco, the automatic mode has been programmed in such a way that the engine always runs in the lowest fuel consumption range, but in certain situations like overtaking, a kick-down function immediately releases the engine's full power. The somewhat wider spread of the five gears also has a favorable effect on consumption.

The second decisive factor for the more than 10% reduction in consumption compared with the standard Corsa is aerodynamic improvement. The designers have succeeded in lowering the drag coefficient from 0.32 to a remarkable 0.29. The main contributing factors to this were the use of paneling for most of the underbody and the engine compartment, a roof spoiler, smooth wheel covers and reduced airflow through the engine compartment. Other minor alterations have also played a role, such as tires with optimized rolling resistance and lowering of the body by about 15 millimeters.

## PRODUCT DESIGN &amp; PERFORMANCE

*Design for environment:*Reducing CO<sub>2</sub> emissions

Automotive carbon dioxide emissions occur because the internal-combustion engine of today runs on fossil fuels such as gasoline and diesel. The clean burning of fossil fuels releases carbon dioxide (CO<sub>2</sub>) into the air (e.g. each gallon, or 3.8 liters, of gasoline results in about nine kilograms of CO<sub>2</sub> when burned). CO<sub>2</sub> is a greenhouse gas. The basic challenge is to meet the world's growing demand for energy necessary to sustain economic growth while also addressing long-term concerns about the environment. We believe the development and global implementation of new, cost-effective energy technologies in all sectors, such as renewable hydrogen, is the most effective way to improve energy efficiency and reduce greenhouse gas emissions. Therefore we have made long-term and near-term voluntary plans to achieve reductions.

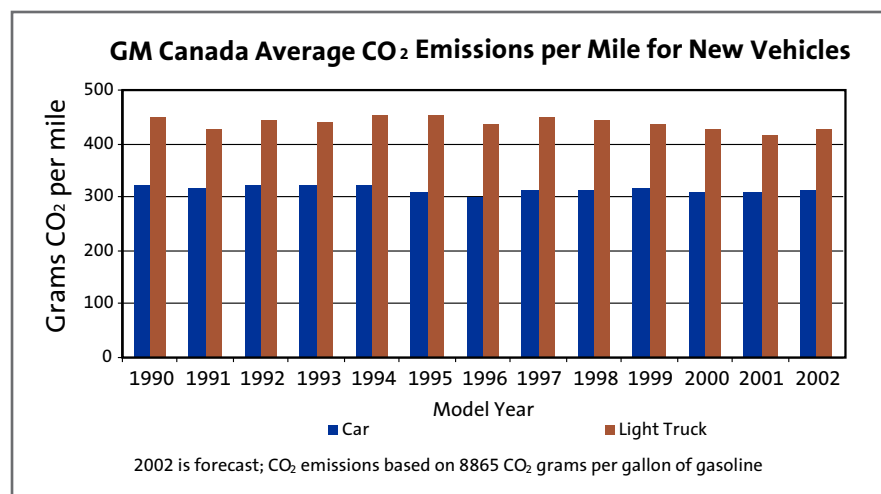
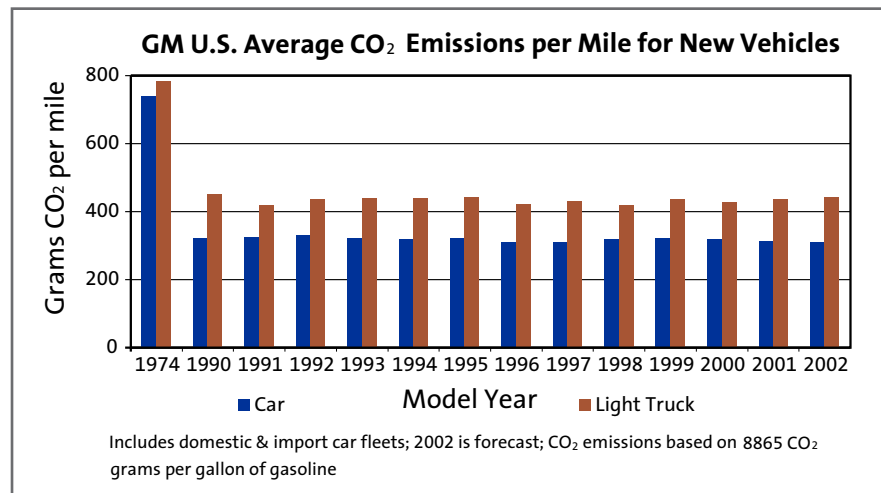
## Global Climate

We believe that the development and global implementation of new, cost-effective energy technologies in all sectors, such as renewable hydrogen, is the most effective way to improve energy efficiency and reduce greenhouse gas emissions. This approach is being facilitated by relying on voluntary initiatives and market-oriented measures.

## U.S. and Canada

The emissions of CO<sub>2</sub> from our cars and light trucks have decreased significantly since the mid-1970's as fuel efficiency has increased. CO<sub>2</sub> per kilometer from new U.S. vehicles has been reduced 58% for cars and 44% for light

trucks since the mid-1970's (see chart below). Since 1990, CO<sub>2</sub> per kilometer has been relatively constant, as consumers have chosen larger vehicles with more features and more powerful engines, thus offsetting much of our fuel economy gains. Our cars and light trucks sold in Canada have followed the U.S. trend since 1990.



## Europe

We have reduced CO<sub>2</sub> emissions per kilometer in our European vehicles by approximately 10% since 1995.

Together with other European automakers we have committed to reduce the average CO<sub>2</sub> emissions for new passenger vehicles by 25% from 1995 to 140 grams CO<sub>2</sub> per kilometer by 2008.

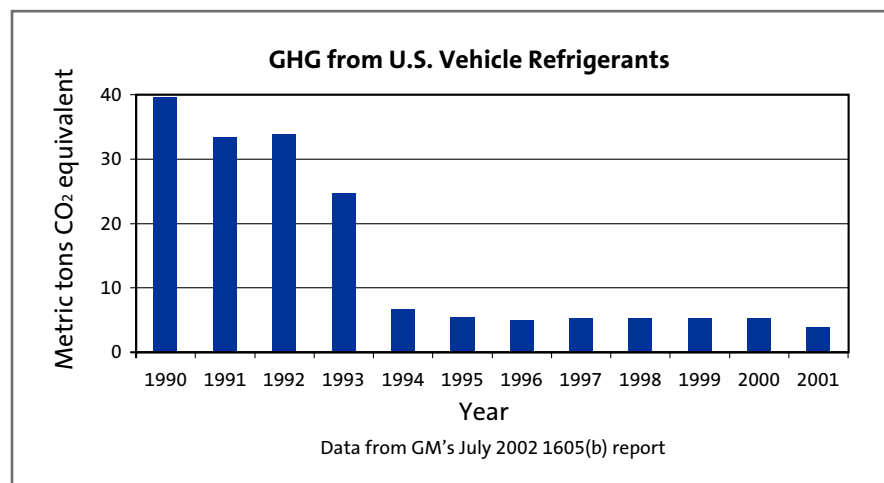
GM's strategy for the European market focuses on three pillars:

- Conventional propulsion
  - Including improvements to conventional engines, lightweight design, aerodynamics and high efficiency transmissions.
  - Our target is to offer uncompromize vehicles with regard to environment, safety, performance at an affordable price (Eco model line up)
- Alternative Fuel Vehicles:
  - Vehicles running on natural gas only, with no compromise of seating or loading capacity. We are leading this ground breaking initiative to open a market for natural gas vehicles and the related development of the necessary fuel supply infrastructure.
- Original Equipment Manufacture (OEM) supply of LPG vehicles in markets that provide strong infrastructure for this fuel.
- Fuel Cells: We are the leading company in Europe in developing and building fuel cell vehicles for the next decade.

GME is actively involved in fostering dialogue between the auto industry and policy makers in Europe on addressing the challenges ahead in reducing transport related CO<sub>2</sub> emissions and creating a common vision of sustainable mobility.

## Chlorofluorocarbons (CFCs)

Estimated greenhouse gas emissions from CFCs used in vehicles produced in the U.S. between 1990 to 2001 are shown below. Since 1990, the estimated emissions have decreased 90%, as CFCs were phased out and replaced by R134a. In Europe, we phased out CFCs in Opel/Vauxhall models in 1993 and provide retrofit air-conditioning parts to allow R134a use in 1986 and later models.



Increasing transmission efficiency

*Manual Transmission Auto Shift (MTA)*

In Europe, Opel and Vauxhall launched the new Corsa in 2000 with an Easytronic (MTA) transmission option, providing the convenience of an automatic with the fuel efficiency of a manual transmission. It is highly efficient, because there is no power loss due to slip as is the case in conventional automatic torque converter transmissions.

*Continuously Variable Transmission (CVT)*

We have implemented another type of transmission — known as the continuously variable transmission (CVT) — that provides the benefits of seamless shifting and the selection of the ideal ratio for any given condition, which also helps to improve fuel economy. This debuted in the US on the 2002 Saturn Vue.

*Lightweight design*

With ever increasing customer demands for extra comfort, convenience, security and safety features that add weight, weight-saving is a great challenge for our development teams. Our vehicles contain a host of weight-saving measures, including the latest lightweight materials such as aluminum engines and intelligent glass, which is thinner and lighter but does not compromise safety, noise or solar control functions. Design techniques such as bionics that enable computers to "grow" a component with the lightest and strongest shape are combined with advanced production processes to further enhance weight savings.

PRODUCT DESIGN & PERFORMANCE

## *Design for environment:*

### Engine Technology

#### Displacement on Demand

This engine technology automatically turns off half of the cylinders during light-load operating conditions to improve fuel economy. The system automatically and seamlessly reactivates the other cylinders when the driver needs the engine's full capabilities for brisk acceleration or load carrying. We will debut the technology in 2004 as part of our Vortec V8 engine family, which power our large trucks and full-size sport-utility vehicles.

#### Variable Valve Timing (VVT)

Variable valve timing enables fuel economy improvement by changing the timing of the valve opening event. This can be used on the intake valves, exhaust valves or both. We have VVT in production on our 2002 Trailblazer, Envoy and Blazer models.

#### TwinPort

TwinPort technology offers great potential for CO2 emission reduction and better fuel economy in small engines up to 1.6L. The technology takes advantage of existing 4-valve technology through a special design of the intake ports that feed each cylinder. This allows better control of the mixture formation of fuel and air in the cylinder under different operating conditions to ensure less fuel is used overall and less CO2 produced.

## PRODUCT DESIGN &amp; PERFORMANCE

*Design for environment:*

## Alternative fuels and propulsion systems

## Advanced Technology Strategy

Our overarching advanced technology strategy for propulsion systems was designed to build capability for increased power and energy efficiency and reduced emissions with the long-term vision of making the transition to hydrogen-fueled fuel cell powered vehicles that emit only clean water and offer twice the energy efficiency of traditional engines. This technology development focuses on fuel cell power systems, hydrogen production (electrolysis and fuel processing), electric drive control and system integration, hydrogen storage, and affordability.

Hybrid-electric powertrains provide a nearer-term commercial opportunity and a technical bridge to fuel cell vehicles through advancing electric drive components and controls. Advances in engine technology for power, energy efficiency and reduced emissions proceed in parallel with the focus on variable valve trains (displacement-on-demand, variable valve activation), homogeneous charge compression ignition (HCCI), direct and multiple-timed injection, and advanced after treatment for ultra-low emissions.

We offer a wide variety of vehicles that deliver low emissions and world-class fuel economy. These currently include a range of 'interim technologies', such as alternative fuel vehicles and clean diesels. Hybrid electric powertrains and other improvements to the century-old internal combustion engine are also under development.

"The 20th century was the century of the internal combustion engine. The 21st century will be the century of the fuel cell."

— Larry Burns  
Vice President, GM R&D and Planning

"We are at the brink of a revolution so dramatic it will reinvent the automobile. We will remain competitive only by providing the technology that customers expect and deserve — today and tomorrow."

— Rick Wagoner  
GM President and CEO

Fuel cell propulsion is about twice as efficient as an internal combustion engine. New important society benefits can be realized from this concept such as renewable energy and minimal emissions. Our reliance on foreign oil will also be reduced.

We are at the brink of a dramatic revolution and have established ambitious targets for developing alternate propulsion vehicles including several hybrid combinations of alternate propulsion with traditional internal combustion and fuel cells.



## Fuel cells

The fuel cell is a realistic alternative to the internal combustion engine, and is now under intense development. The fuel cell uses the reaction between hydrogen and oxygen to produce electricity. It takes its oxygen from the air we breathe. Hydrogen and oxygen combine in the reaction, the end products being electricity and water. The electricity can be used for running an electric motor that propels the car.

Hydrogen can be provided in various ways. One way is to split water into hydrogen and oxygen. The hydrogen can then be put into a tank aboard the vehicle. However, there are obstacles to be overcome.

The infrastructure for the distribution and storage of hydrogen has to be realizable in practice. Another way of supplying the fuel cell with hydrogen is to complement the cell with an onboard reformer that will extract hydrogen from fuels such as gasoline and methanol. Varying amounts of carbon dioxide will be emitted during the reformation process, depending on the kind of fuel used.

Our ultimate goal is to put hydrogen-powered fuel cell vehicles on the road by 2010. In the meantime we are researching a bridge technology — gasoline-fed fuel cells — to promote this clean, quiet form of transportation.

## HydroGen3

Following on from the success of HydroGen1, we have unveiled the next generation fuel cell car based on the Zafira. With more power, a simpler start-up procedure, significantly lighter and with a more compact fuel cell stack, the new Hydrogen 3 fuel cell car is a step nearer coming to production.

With a range of about 250 miles the car has the same load space as the conventional Zafira in 5-seater mode, goes from a 0-60 mph in 16 seconds and has a top speed of 93.5mph.

## AUTOnomy

The AUTOnomy concept vehicle, first shown at the North American International Auto Show in 2001, was the first purpose-designed vehicle combining the benefits of fuel cells and drive by wire technology. Discarding the restrictions of conventional vehicle design based around the internal combustion engine, the vehicle consists of an innovative, skateboard-like chassis, incorporating all the running gear, such as fuel cell powered electric drive, steering and braking systems, onto which a variety of different body styles, from a two-seater sports car to a people carrier, can be placed as required.

An international jury of 41 motoring writers recently voted the AUTOnomy "Engine of the Year — Best Concept" in the prestigious Engine Technology International Awards. Graham Johnson, jury president and editor of the publication, said of AUTOnomy: "At last a purpose-design fuel cell car, AUTOnomy shows that the space-age propulsion system can be attractive."

## FUEL CELL TECHNOLOGY CENTER

We have expanded our ability to develop fuel cell technology with the opening of a new research facility in Honeoye Falls, New York. The 64,000-square-foot development center will develop fuel cell technology for commercial use. Its initial focus will be on developing fuel cell stacks, fuel processors, electrolyzers and the systems around them into products for both stationary and transportation uses. This facility and the work it conducts will help us determine how to offer fuel cells on a large-scale basis in preparation for market-ready products.

## Hy Wire

The GM Hy-wire, appropriately named for its technology, incorporates the features first envisioned in the AUTOnomy concept vehicle. All of the touring sedan's propulsion and control systems are contained within an 11-inch-thick skateboard-like chassis, maximizing the interior space for five occupants and their cargo. There is no engine to see over, no pedals to operate — merely a single unit called X-drive that is easily set to either a left or right driving position.

## Working in partnership

To further fuel cell development, we have established equity partnerships with leading companies, including General Hydrogen Corp., Giner Electrochemical Systems, L.L.C., Hydrogenics Corp., and Technologies Worldwide, Inc. We are also collaborating with Suzuki Motor Corp. and Toyota Motor Corp. on fuel-cell technology development, and BP Amoco, ExxonMobil, and ChevronTexaco on fuels research.

In June 2001, we acquired an equity interest in General Hydrogen, and the companies announced a 25-year collaboration to accelerate the spread of a hydrogen infrastructure, and to speed the introduction of fuel cell vehicles in markets in North America, Europe, Asia and emerging economies. The strategic alliance covers several key areas, including hydrogen storage, fuel cell vehicle refueling, energy services, advanced materials, power electronics and electric power production.

## FreedomCAR

FreedomCAR is a partnership between the USCAR companies (GM, Ford and DaimlerChrysler) and the US Department of Energy to aggressively advance the timing of research for scientific breakthroughs needed to ensure technical feasibility and broad affordability of energy efficient powertrains and lightweight vehicle structures. FreedomCAR focuses on a broad portfolio of technologies, but with the primary emphasis on enabling the transition to hydrogen fuel and fuel cell vehicles. The FreedomCAR partners oversee an annual \$150M federal R&D budget, which is complemented by engineering research on vehicle applications by GM and the other member companies that is evidenced in concept, prototype and production vehicles.

## Hybrids

We have developed hybrid power systems capable of powering many of the vehicles in our various vehicle classes. Hybrid electric propulsion systems, combine internal combustion engines and electric drives to dramatically increase fuel efficiency and reduce vehicle emissions. Plans announced for production include buses (Allison Hybrid System), full-size pickups (PHT), and a future powertrain for front-drive cars and trucks (ParadiGM). The biggest gains in fuel savings from hybrid technology are in the largest vehicles with the highest fuel consumption. By focusing on these vehicles first we can make a greater impact on emission reductions and fuel economy.

## Alternative fuels

Alternative fuels in today's motor vehicles offer environmental benefits while helping to bridge the transition from the internal combustion gasoline powered vehicle to tomorrow's advanced technology vehicles. The use of alternative fuels offers benefits in the reduction of some vehicle tailpipe emissions. Furthermore, the use of alternative fuels, especially those made from renewable sources, can reduce greenhouse gas emissions. We offer vehicles in the U.S. that operate on either E85 ethanol or gasoline fuel or any blend. In the U.K., the government pays for 75% of the cost of the LPG option on our Vauxhall DualFuel vehicles.

Together with British Petroleum (BP), we are working on several joint projects to encourage the development of clean fuel technologies and clean fuel infrastructure. For example, the two companies have reached an agreement to have E85 fuel available at a fueling station in Southeastern Michigan to enable refueling, among others, of our expanding E85 truck fleet that has been created by requiring a portion of the Product Evaluation Performance (PEP) fleet operated in that area to be refueled on E85. In the U.K., Vauxhall is working with BP to encourage the introduction of LPG at filling stations to help spread the use of this cleaner fuel.

During the 2000 model year, both Chevrolet and GMC began to offer base engines capable of dual-fuel operation on their North American small pickup offerings (S10 and Sonoma). The vehicles are capable of operating on E85 (85% fuel ethanol and 15% conventional gasoline) or conventional gasoline or any combination. We offer E85 flex-fuel capability on our full-size 2002 model year utility vehicles and full-size pickups equipped with the 5.3L V8 engine and federal emissions. In fact, we have expanded model availability of E85 equipped full-size pickups for the 2003 model year. In the U.S., we continue to make available full-size pickups, full-size vans and Chevrolet Cavaliers that are capable of Bi-Fuel compressed natural gas (CNG)/gasoline operation, as well as dedicated CNG full-size vans. Opel builds versions of its Zafira and Astra models that are powered by natural gas only — making the greatest use of the environmental benefits of this fuel.

#### VAUXHALL LEADS THE WAY

Vauxhall DualFuel vehicles offer significant reductions in emissions of harmful exhaust fumes when running on liquid petroleum gas instead of petrol and are eligible for the highest level of support from the U.K. Government's Powershift program designed to encourage the use of cleaner fuels. Customers also benefit from fuel prices around half those of gasoline, lower road tax and company car tax rates. Vauxhall sold 2000 DualFuel vehicles during 2001, representing around 71% of the new factory-fitted car market and further demonstrating Vauxhall's four-year leadership in promoting the use of cleaner-burning LPG.

PRODUCT DESIGN & PERFORMANCE

## *Design for environment:*

### Noise

There is growing concern regarding the effects of excessive noise in all world markets. Vehicle noise/traffic noise is a specific concern to the public in urban environments. In an effort to control community noise most governments regulate vehicle noise levels.

We actively participate in the reduction of community noise by ensuring all of our vehicles meet or exceed the most stringent noise requirements for the markets in which they are sold. We continually pursue new technologies to improve vehicle noise performance. Through involvement in the International Standards Organization (ISO), we are directly involved in the development of improved vehicle noise test procedures to address community noise concerns.

PRODUCT DESIGN & PERFORMANCE

## *Responsible product use:*

### Environmental protection

Our vehicles are designed to reduce resource use. When drivers act responsibly, they can reap the benefits of the vehicles' considerable technical potential in the areas of fuel efficiency, low emissions, and moderate noise.

Fuel consumption is highly dependent on individual driving habits. A smooth and defensive driving style is not only easy on the environment and on the driver's wallet, but also helps extend the life of all vehicle components. Conversely, a hectic driving style with frequent starts and stops and rapid acceleration and braking, leads to substantially higher fuel consumption. The intelligent on-board computer in many of our models enables the driver to check current fuel consumption at the touch of a button. We also provide detailed information in the operating manual regarding environment-friendly and fuel-efficient driving habits.

PRODUCT DESIGN & PERFORMANCE

## Responsible product use:

### Safe driving

There is much evidence to show that encouraging safer motor vehicle use can help improve safety for road users.

- \* Automotive markets with high levels of safety belt and child restraint use have lower fatality rates than countries with lower restraint use rates.
- \* Countries with strong anti-drunken driving laws experience lower incidence of alcohol-involved driving fatalities.
- \* Programs that enable young drivers to learn to drive over time, under graduated licensing laws, are proven to reduce the disproportionate fatality involvement of inexperienced drivers.
- \* Guidelines to help reduce distractions for drivers are intended to help reduce the incidence of crashes by helping drivers maintain their focus on the driving task.

We fully support such initiatives and support programs that encourage safe driving behaviors.

### Child restraint and safety belt use

Many of the people killed in traffic crashes in the U.S. are unrestrained in child restraints and safety belts. We support a societal norm in which all occupants properly use restraints — every time, on every trip.

In the U.S., we are a founding member of the Air Bag & Seat Belt Safety Campaign, whose objectives are to educate the public on the facts associated with restraints, to encourage and support passage of strong restraint use laws, and to effectively and equitably enforce those restraint use laws. In 1998, the Campaign initiated Operation ABC Mobilization, a national traffic safety initiative focused on child safety. During two Mobilization weeks each year, over 11,000 law enforcement agencies focus on enforcement of restraint use laws during concurrent high levels of public awareness. Since that time, safety belt use in the U.S. has increased 14 percentage points, from 61% to 75%, according to the National Highway Traffic Safety Administration.

Motor vehicle crashes are the leading cause of death for children. To help educate families on child restraint use, we formed a partnership with the National SAFE KIDS Campaign® SAFE KIDS BUCKLE UP (SKBU), the nation's leading private sector child passenger safety program. It is a multi-million dollar program that began in 1996. It is a partnership between the UAW-GM Center for Human Resources, GM, and National SAFE KIDS Campaign. Since 1996, more than \$25 million has been donated to the SKBU program to address the crucial issue of child passenger safety. The SKBU program has checked more than 274,000 child safety seats in communities across the nation. In addition to checking child safety seats, the SKBU program has held more than 7,600 child safety seat check-up events, donated more than 250,000 child safety seats, and sponsored over 700 GM dealership education workshops.

Together with the UAW in 2001, we recommitted our support of SKBU by agreeing to fund child safety seat donations for low-income families and at-risk children and establishing 30 new permanent child safety seat inspection stations.

In April 2002, with the UAW, we donated 30 Chevrolet Express vans to local SAFE KIDS Coalitions across the nation. These new Chevrolet Express vans joined the 51 Chevrolet Venture vans donated in 1999 to establish the nation's first-ever fleet of mobile car seat check-up vans -- one for each state and the District of Columbia. The fleet of SKBU Venture and Express vans are fully equipped with everything needed to hold a travelling child safety seat check-up event, including tents, traffic safety cones, and signage.

SKBU also provides bilingual educational materials, a public service campaign, a toll-free hotline (800-441-1888) and millions of dollars in local grants to allow SAFE KIDS coalitions to take this most important service to the public. Additional child safety seats have been donated to families in need through a distribution program with the National Association for the Advancement of Colored People (NAACP) and the National Council of La Raza.

Standard enforcement safety belt use laws are directly correlated with high young driver safety belt use. We encourage enactment and equitable enforcement of standard enforcement safety belt use laws through our support of the Air Bag & Seat Belt Safety Campaign.

Following our lead, other manufacturers in the U.S. have initiated child safety programs, in some cases, implementing elements of the GM-initiated programs. We support the actions of all auto manufacturers in helping to encourage all occupants to be properly secured on every trip, every time.

To learn more about child safety and proper restraint use, see [www.safekids.org](http://www.safekids.org), [www.gm.com](http://www.gm.com), and [www.nsc.org/airbag.htm](http://www.nsc.org/airbag.htm).

#### Drunken Driving

In the U.S., alcohol is a factor in over 17,000 fatalities annually or 41% of all traffic fatalities. We commend the action of the U.S. Congress in passing incentives to encourage states to enact 0.08 Blood Alcohol Concentration (BAC) drunk driving laws by September 2003. To help decrease the risk of drunken driving fatalities and injuries, we have supported Mothers Against Drunk Driving (MADD) for many years.

In 1999, we committed to a multi-million dollar, multi-year relationship with MADD. Through this commitment, we are a co-sponsor of the annual "Tie One On For Safety" Red Ribbon Campaign. In 2001, Saturn was the national sponsor of the MADD "Tie One On For Safety Red Ribbon Program." Our contribution underwrites DRIVEN, MADD's biannual magazine. In MADD's programs focused on children, our contribution supports the "Protecting You, Protecting Me" school program for children in kindergarten through fifth grade.

In 2001, GM and Chevrolet supported a school outreach program newly initiated by MADD. The program includes multi-media programs for elementary and middle / high school students and their families. Chevrolet donated the use of 10 Chevrolet Suburbans for transport of the program materials and presenters. We helped with program financial support.

Our funding also sponsored a national conference commemorating MADD's anniversary in September 2000, the International Candlelight Vigil and Victim Conference for victims of drunk driving in December 2000, and, with the NHTSA, a legislative reception in Washington, D.C., in fall 2001. Our support also helped further MADD's efforts to reach out to people of diverse ethnic backgrounds.

To learn more about the consequences of drinking and driving, please see [www.madd.org](http://www.madd.org) or [www.gm.com](http://www.gm.com).

#### Focus on occupant compartment and trunk anti-entrapment

In 1999 and again in 2001, we led the auto industry in announcing research on technologies to help prevent children from dying or suffering permanent injuries when trapped in the trunk or the occupant compartment of motor vehicles. In line with our research, we launched public awareness efforts to help prevent trunk entrapment and occupant compartment heat-related deaths and injuries. In 1999, we produced the brochure, "Trunks are for elephants" and distributed millions of copies through GM dealerships and public health organizations. In 2001, we produced the brochure, "Never Leave Your Child Alone," which is available on our web site and is being distributed through local SAFE KIDS Coalitions and public health and traffic safety organizations.

#### Focus on young drivers

In many countries, young drivers are disproportionately represented in crash fatalities and injuries. Enactment of graduated licensing laws in several automotive markets is proving to be a success, helping to reduce the risk of young driver crashes. We support the passage of these graduated license laws. Since underage drinking is a factor in motor vehicle crashes, we support traffic safety initiatives focused on the problem of under age drinking through Mothers Against Drunk Driving.

#### Focus on distracted driving

Drivers can be distracted for many reasons: state of mind; non-driving-related activities, such as shaving and eating; other occupants; non-vehicle technologies, such as cell phones and hand-held computer devices; or even by some vehicle systems, such as entertainment and climate control. We are conducting research on the issue and already have established a common-sense guide for the development and implementation of telematic and information delivery systems in our vehicles.

Our principles are:

- \* Minimize hands-off-wheel and eyes-off-road time.
- \* Minimize the number of steps required to complete any given task.
- \* Create common interface (look and function) systems.
- \* Limit availability of particularly demanding tasks while driving.

Various international industry organizations are now adopting these principles as a basis for discussions on voluntary standards, and other manufacturers are following GM's lead in applications.

Public research identified the potential benefit of increased driver awareness and education to help reduce and eliminate actions that contribute to driver distraction. In March 2001, we launched the SenseAble Driving program in the U.S. The program is intended to help address public misinformation and increase driver's awareness of situations that contribute to distraction from the driving task. The SenseAble Driving program includes an interactive computer demonstration on our web site [www.gm.com](http://www.gm.com), a poster and brief video initially displayed in State of Michigan Secretary of State (motor vehicle licensing) offices, and a brochure on driving safety tips.



## PRODUCT DESIGN &amp; PERFORMANCE

*End-of-life vehicles:*

## Dismantling &amp; recycling

To meet regional requirements for end-of-life vehicles, we have organized a global End-of-Life Vehicle Team. The team ensures that we provide the necessary support to our regional business units in a common manner. Methodologies for calculating the recoverability of a vehicle and the basis for developing reports that some governments require are being developed jointly with vehicle manufacturers around the world through the respective automotive trade associations. Since 1994, we have participated in a series of car recycling workshops to promote responsible treatment of end-of-life vehicles (ELV) regardless of where they are used and retired.

In our North American, European, and Asia/Pacific regions, we continue efforts to improve the end-of-life vehicle infrastructure through appropriate partnerships. In North America we continue to develop new technologies through the Vehicle Recycling Partnership and its recycling infrastructure partners. In Europe, Opel and Vauxhall are committed to working with industries involved in taking back, treating, and scrapping ELVs to reduce the amount of automotive waste going to landfill to 5% of a car's weight as compared to 25% in 2000- over the next 15 years. GM Japan and the Alliance Partners are directly involved in the development of a recycling law for Japan and in managing the corporate business issue that result.

## North America

In a first among U.S. automakers, we are making our vehicle recycling information easily accessible by posting the manuals to our web site.

End-of-Life Vehicle manuals are available at [www.gmability.com](http://www.gmability.com).

ELV manuals provide automotive dismantlers with information on which parts of a vehicle can be recycled. Currently, 75% of a car is recycled because the majority of it is metal. But few plastics on vehicles are recycled. With ELV manuals now easily accessible, there is potential to significantly increase the percentage of the vehicle that is recycled.

These manuals provide the basis for increasing the recycling of plastics and other materials not currently recycled. Posting ELV manuals on [www.gmability.com](http://www.gmability.com) is part of the corporation's overall sustainability effort to balance business, social and environmental goals.

There are thirteen manuals available that detail how to dismantle for recycling the vehicle models that are exported to Europe.

## Europe

In Europe, Opel and Vauxhall provide all contracted dismantlers with a dismantling manual that contains detailed information on all removable plastic components, their weight, composition, and the time it takes to dismantle. It is important for mechanical recycling that incompatible types of plastic are not mixed after shredding, as different materials can only be separated afterwards with great difficulty.

The information in the dismantling manual is now also available in a user-friendly CD, a result of the International Dismantling Information System (IDIS) to which Opel and Vauxhall contributed. The IDIS consortium, originally a development project of European vehicle manufacturers, now comprises 21 vehicle producers from around the world.

The latest release of the CD, containing information in eight languages on environmentally sound pre-treatment and dismantling of over 360 different vehicle models from the world's largest manufacturers, was distributed free of charge to European dismantlers in early 2000.

Rapid and cost-effective solutions can be found through close cooperation with dismantlers. For example, we have provided dismantlers with detailed information on how to centrally de-activate air bags to eliminate potential hazards during dismantling.

To optimize the dismantling operations, we address issues of this sort early in the vehicle development cycle. The company is also making a significant contribution to creating a market for recycled materials. Use of recycled plastic materials in Opel/Vauxhall vehicles rose to 30,000 metric tons in 2000. This helps stimulate the demand for recycled plastics, thereby encouraging greater levels of recycling in the future.

## PRODUCT DESIGN &amp; PERFORMANCE

*End-of-life vehicles:*

## EU ELV directive

In September 2000 the European Parliament passed a directive to address this issue. The European Directive on End-of-Life Vehicles (ELVs) requires final vehicle owners to return ELVs to authorized collection networks to obtain "certificates of destruction" necessary to deregister vehicles. According to the Directive, the delivery of the vehicle to an authorized treatment facility shall occur without any cost for the last holder and/or owner as a result of the vehicle's having no or a negative market value.

The Directive has three major consequences for the auto industry:

- \* Obligation to cover "all or significant part" of any take-back costs for new cars put on the market as of July 2002 and all ELVs starting in 2007 (Member States may bring this latter date forward if they wish)
- \* The Directive's target values for the recovery or recycling of ELVs are:
  - (a) -85% by weight re-use/recovery and 80% by weight re-use/recycling to be achieved by 2006
  - (b) 95% by weight re-use/recovery and 85% by weight re-use/recycling to be achieved by 2015
- \* Materials and components of vehicles put on the market in July 2003 shall not contain lead, mercury, cadmium and hexavalent chromium other than in those cases defined in the exemption list (Annex II of the Directive). Some uses of banned materials are still under discussion; a special technical committee will review this list and revise Annex II as necessary.

To meet these objectives, Vauxhall, Opel, Saab and our other companies operating in Europe have a dedicated ELV organization. This group is working closely to step up efforts already underway in each part of the company to increase the use of recycled materials across our entire product range and to establish markets for recycled material to make recycling economically viable. With respect to dismantling our European companies are part of the International Dismantling Information System. We have adopted the Design for Recycling (DFR) concept for all newly designed vehicles. DFR includes, for example, reduced complexity of materials and improved fastening technology (easy to dismantle). All plastic components are marked to identify the material content. Design for recycling concepts are conveyed to design engineers and suppliers through a global specification GMW 3116.

We support harmonization of environmentally sound ELV treatment in Europe. Opel, Vauxhall and Saab are working together with all businesses and associations involved in collection and recycling to reduce the burden on landfills in accordance with the EU directive.

Since legislation, or voluntary agreements, on handling ELVs already exist in many cases, we are working to build on these national models wherever possible, for example in Denmark, Germany, Sweden, and the Netherlands. In countries where no programs of this type exist, we are creating a collection system in cooperation with other interested economic operators.

Through increasing availability and use of recycled materials, product development is also helping to accelerate the creation of markets for these materials. Opel and Vauxhall are committed to working with industries involved in taking back, treating, and scrapping ELVs to reduce the amount of automotive waste going to landfill from 25% of a car's weight today to 5% by the year 2015.

## *Contact us:*

We welcome feedback on our approach to corporate responsibility and sustainability reporting. Contact us with your comments and questions online, by mail or by fax.

- \* Online: [www.gm.com/contact\\_us](http://www.gm.com/contact_us)
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October 2002

## About this report:

This is General Motors' fourth report providing information on our social responsibility and sustainability. Our reporting has evolved since the publication of our first environmental, health and safety report in 1994, and now includes information formerly presented in that report, as well as our former annual philanthropic report. For the third consecutive year, in the spirit of innovation, conservation and to further demonstrate our commitment to the preservation of natural resources, the report is fully Internet-based. A summary document is provided on the website for download or printing.

This report is global in scope, except where noted, and covers performance for reporting year 2001. Management progress and individual initiatives are included up to time of publication.

This report is coordinated through contributions of information and data from employees throughout General Motors. Unless otherwise noted, the report presents data for the 2001 calendar year, the most current data available. Unless otherwise noted, all data are normalized by production. Data reported may change due to updated information received after publication. As a result, occasional variances may appear in comparisons from year-to-year.

This report follows the Global Reporting Initiative (GRI) Sustainability Reporting Guidelines, issued in 2000. The Guidelines have been developed for voluntary use by organizations reporting on the economic, environmental, and social dimensions of their activities, products and services. The GRI guidelines were the result of a multi-stakeholder, international collaboration. We are proud to have been closely associated with their development, since their inception in 1997, as a member of the GRI Steering Committee, a pilot company, and as a member of various GRI work groups. GM is also proud to currently be a member of the GRI Charter Group and the Stakeholder Council. For more information or to view the guidelines, see [www.globalreporting.org](http://www.globalreporting.org).

In preparing this report, we have fully reviewed and updated our 2000/2001 report. In recognition of the fact that many aspects of our business do not change from year-to-year, and in order to leverage the benefits of the Internet, we have not fully rewritten sections of the report where information from our 2000/2001 report is still valid. This includes information that has not changed significantly, areas where our management approach remains the same, and initiatives and projects that are ongoing. Such sections, however, have been thoroughly reviewed and verified by experts in our organizations and have been edited accordingly. All data and related explanations of performance have been updated for calendar year 2001. This approach enables us to move towards "real time" reporting with timely updates added as and when available, thereby strengthening our commitment to open and transparent reporting on our corporate responsibility and sustainability activities and performance.

This report has been completely developed and published on the Internet, using an innovative electronic collaboration tool. All collection, writing, review, editing, and approval aspects of the report development were completed using this tool. This resulted in a virtually paperless development process.

### Note.

Unlike the full internet version of the report, this Adobe Acrobat .pdf version does not contain pictures, pop-up windows or hyperlinks to other internet information. Reference should always be made to the full internet document (url given below) and its attendant links.

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