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Environment

2009 HIGHLIGHTS:

- For the fifth consecutive year, honored with an Energy Star Sustained Excellence Award from the U.S. EPA and DOE
- Reduced CO_2 emissions from our facilities by more than 44 percent from 2000 to 2009
- Reduced global water use by 16.6 percent and landfilled waste by 20.7 percent, relative to 2008

We continue to reduce the environmental footprint of our vehicles and our operations in line with our blueprint for sustainability.

This section reports on the environmental impacts of our operations, including those from our products, our manufacturing processes and our facilities and properties. For a high-level view of impacts throughout our value chain, please see Our Value Chain and Its Impacts.

RELATED LINKS

This Report:

- Materiality Analysis
- Climate Change
- Our Value Chain and Its Impacts

Assessing Materiality

The materiality analysis used to plan this report identified eight environment-related issues as among the most material:

- Low-carbon strategy
- Vehicle greenhouse gas (GHG) emissions
- Fuel economy
- Cleaner technologies
- Public policy: GHG/fuel economy regulation
- Low-carbon fuels
- Vehicle electrification
- Emissions trading and the cost of carbon

The analysis also revealed a global theme of increasing expectations regarding, and regulation of, a range of environmental issues associated with our products and manufacturing facilities. These issues include energy and water use (due to rising costs and concerns about long-term availability); tailpipe emissions and end-of-life management (due to increasing regulation); and product materials use (due to opportunities to improve the environmental performance of vehicles and cut costs through "cradle-to-cradle" solutions).

Some of these topics are covered in this section, while others are covered in the Climate Change section.

Precautionary Principle

The precautionary principle is the idea that if the consequences of an action are unknown, but are judged to have some potential for major or irreversible negative consequences, then it is better to avoid that action. We do not formally apply the precautionary principle to decision making across

all of our activities. However, it has influenced our thinking. For example, in addressing climate change as a business issue, we have employed this principle.

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Progress and Goals

Progress

In 2009, Ford made significant progress on the environmental aspects of its products and operations. For example:

- In 2009, Ford committed that every all-new or redesigned vehicle we introduce will be best in class or among the best in class for fuel economy in its segment. Since then, we have followed through on this commitment with vehicles introduced in both the United States and Europe, and we will continue to do so with future product launches.
- For the 2009 model year, the Corporate Average Fuel Economy (CAFE) of our cars and trucks increased by 4.2 percent relative to 2008. Preliminary data for the 2010 model year shows a 3.2 percent improvement in CAFE for cars and a slight decline of 2.4 percent in CAFE for trucks compared to 2009.
- Ford is continuing to develop a comprehensive sustainable materials strategy to maximize the effectiveness and broaden the implementation of sustainable materials in our vehicles. One of the key goals of this strategy is to identify and globally implement materials technologies that improve environmental and social performance and lower costs. We also continue to expand our use of recycled and renewable materials.
- For the fifth consecutive year, Ford was honored with an Energy Star Sustained Excellence Award from the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE). This award recognizes Ford's continued leadership in and commitment to protecting the environment through energy efficiency.
- Ford reduced CO_2 emissions from our facilities by more than 44 percent from 2000 to 2009 and by 17.7 percent on a per-vehicle basis from 2000 to 2009.
- We continued our leadership in facility greenhouse gas reporting in 2009. Voluntary GHG reports were developed for all four Ford manufacturing sites in China. The CEO of Ford China presented these reports to senior Chinese government officials in December 2009.
- Ford continued to reduce water use and waste sent to landfill in 2009. We reduced global water use by 16.6 percent and landfilled waste by 20.7 percent, relative to 2008.
- Ford introduced packaging guidelines for the transport of parts and materials used in Ford vehicles. These guidelines require supplier-provided packaging to support corporate sustainability goals by seeking a neutral or positive environmental footprint through zero waste to landfill and the use of 100 percent recycled, renewable or recyclable materials.
- We won a 2009 Green Choice award from ***Natural Health*** magazine for continuous efforts to build a greener future. This award is based on a range of environmental action areas, including alternative energy use, greenhouse gas emissions, water use, recycling, operational energy footprints, and LEED® (Leadership in Energy and Environmental Design) green building certifications.

RELATED LINKS

This Report:

Ford's Goals, Commitments, and Status

2009 Year-Over-Year Environmental Performance Metrics and Goals

Products

Goal	2009 Accomplishments
Product Sustainability Index (PSI)	
Expand use of the PSI and Design for Sustainability principles in	• 2009 Ford Fiesta developed using PSI

product development	
Sustainable Materials	
Increase the use of recycled, renewable and lightweight materials	• Expanded use of soy foam seating • Introduced soy foam headliner • Introduced wheat straw reinforced plastics • Expanded use of recycled content fabrics for seats and headliners • Continued to develop strategy requiring recycled plastics and textile materials for many applications in North America
Increase use of and certification for allergen-free and air-quality-friendly interior materials	• Established global design guidelines for allergen-free materials and in-vehicle air filtration that are being migrated across product lines
Eliminate mercury and lead content in vehicles	• As of 2009, all Ford, Lincoln, and Mercury vehicles in the U.S. are mercury-free, with the exception of the Lincoln Town Car, which uses mercury in its high-intensity discharge headlamps • Have eliminated use of lead wheel weights in North America and Europe
Product Fuel Economy and Greenhouse Gas Emissions	
Reduce CO_2 emissions of U.S. and EU new products by 30 percent by 2020, relative to a 2006 model year baseline	• Continued fuel economy improvements. Accelerated our electrification strategy. Worked to develop climate policies.
Have every all-new or redesigned vehicle we introduce be best in class or among the best in class for fuel economy in its segment	• Since 2009, have followed through on this commitment with vehicles introduced in both the U.S. and Europe, and we will continue to do so in future product launches

Facilities

Metric	2009 Target	2009 Actual	2010 Target
Energy Use			
Facility energy efficiency (global)	3% improvement	8% improvement [1]	3% improvement
Facility energy efficiency (United States)	3% improvement	4.6% improvement [2]	3% improvement
Energy use	No specific goal; continue use reductions	44% improvement compared to 2000 levels	No specific goal; continue use reductions
Emissions			
VOC emissions from painting at North American assembly plants	Maintain 24 g/sq meter or less	21 g/sq meter	Maintain 24 g/sq meter or less
Water Use			
Water use (global)	6% reduction	16.6% reduction	6% per unit reduction from 2009 [3]
Waste Production			
Landfill waste (global)	10% reduction	20.6% reduction	10% per unit reduction from 2009 [4]

1. Energy efficiency is calculated in million Btus per unit. For our global efficiency calculation, energy use is not adjusted for variances in production or weather. We experienced an improvement in global energy efficiency of 8 percent during 2009, despite an 8 percent reduction in production that year; global energy consumption was reduced by 16 percent, due in part to lower production volumes.
2. This is a percent improvement in our North American energy efficiency index, which is normalized based on an engineering calculation that adjusts for typical variances in weather and vehicle production. The Index was set at 100 for the year 2000 to simplify tracking against our target of 1 percent improvement in energy efficiency. Therefore, the 4.5 percent improvement in 2009 is based on a year 2000 baseline.
3. Starting in 2010, our main water use target will be set and tracked on a per-vehicle basis as opposed to total global use, as has been done in previous years.
4. Starting in 2010, our main waste reduction target will be set and tracked on a per-vehicle as opposed to a total global reduction, as has been done in previous years.

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Environmental Management

Ford has an environmental Policy and environmental Directives that apply to our operations globally (see our Code of Conduct Handbook). All Ford manufacturing facilities and our product development function are certified to ISO 14001, the leading global standard for managing environmental issues. In addition, we have asked our preferred "Q1" suppliers of production parts to certify their facilities. These commitments place our most significant potential environmental impacts under one comprehensive environmental management system.

In this section, we report on the environmental management systems we use in manufacturing and product development, as well as with our supply chain, to ensure that environmental issues are addressed.

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Manufacturing

Ford's manufacturing management sets environmental targets annually for all of our facilities. We develop these targets through a comprehensive process that considers past performance, future regulation trends, environmental technology advances, financial conditions and other relevant factors. The global targets are then translated into regional- and facility-level targets, which differ depending on the relevant regulations and financial and production constraints in each region. Within our powertrain operations, for example, goals are set by determining the highest-performing powertrain plant for each environmental performance metric. Then each "best-in-class" plant's performance becomes the new goal that every powertrain plant is required to meet. For more information on our best-in-class powertrain environmental initiative please see Ford's "Best in Powertrain" Environmental Initiative Produces Impressive Results.

In 2005, we began to implement an Environmental Operating System (EOS) at our North American assembly plants. As a counterpart to our Quality Operating System, the EOS provides a standardized, streamlined approach to maintaining compliance with all legal and Ford internal requirements. The EOS drives compliance responsibility to the operations level by assigning compliance-related tasks to the appropriate personnel and tracking the completion of those tasks.

The EOS is integrated with other key management systems at the plant level, including ISO 14001. The EOS provides information, standardized tools and processes to support the ISO 14001 requirement to identify and manage compliance issues. The EOS has been fully implemented throughout our North and South American operations, and will be implemented throughout our global operations by the end of 2010.

Ford has moved to group ISO 14001 certification for its plants in North America. All powertrain plants share a single group certification. Likewise, assembly plants, stamping plants, Ford Customer Service Division facilities and South American plants each have their own group certification. Instead of being audited yearly by a third party, each plant is now audited every three years. Group certification saves time and money, with no degradation in plant environmental performance.

In 2007, we implemented the Global Emissions Manager (GEM) database, which provides a globally consistent approach for measuring and monitoring environmental data. This system helps us track our efforts to reduce water consumption, energy use, carbon dioxide emissions and the amount of waste sent to landfill. The data that GEM provides and the level of analysis it allows also helps us set more effective environmental management targets and develop more specific strategies for improving environmental performance. We are continuing to add metrics and tracking systems to GEM to further enhance our environmental management objectives.

RELATED LINKS

This Report:

Operations

External Web Sites:

ISO 14001

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Product Development

In Ford's Global Product Development System, environmental objectives – including targets for fuel economy, vehicle emissions, the use of recycled and renewable materials, and restrictions on substances of concern – are defined at the outset of the design process for every new Ford vehicle. We track our progress toward these targets throughout the product development process. The targets are broken down from the vehicle level to the supplier or component level, and they enter into each contractual agreement signed between Ford and its suppliers.

As part of our ONE Ford global integration process, we are developing targets for a range of vehicle attributes, such as fuel economy, quality and safety, which will make our vehicles either leaders or among the leaders compared to competitor vehicles in the same segments. We develop these competitive vehicle attribute targets for every vehicle program, to deliver on key customer demands and Ford strategies, by using a range of consumer data, internal brand data and competitor vehicle data. Based on this process, in 2009 we committed that every all-new or redesigned vehicle we introduce will be the best in class or among the best in class for fuel economy in its segment. Since that time, we have followed through on this commitment with vehicles introduced in both the United States and Europe, and we will continue to do so in future product launches. For examples of 2010 and 2011 vehicles that meet this commitment, please see Delivering More Fuel-Efficient Vehicles.

In addition, we have identified global leaders and attribute teams who coordinate the development of global product attributes targets in key areas such as sustainable materials, recycling, materials of concern, vehicle interior air quality and vehicle life-cycle issues. These leaders coordinate the global implementation of our corporate sustainability strategies and support our ONE Ford strategy to harmonize product development across regions.

We use our Design for Environment (DfE) tool to bridge the gap between product development and environmental management. DfE uses simplified life-cycle assessments and cost calculations, substance restrictions, checklists and other tools to identify and reduce significant impacts. We are continuing to broaden the range of issues we consider in our product development process as we move from Design for Environment to Design for Sustainability (DfS). Ford of Europe's Product Sustainability Index is incorporating DfS principles, in order to improve each vehicle's environmental, social and economic performance.

RELATED LINKS

This Report:

- Delivering More Fuel-Efficient Vehicles
- Product Sustainability Index

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Suppliers

ISO 14001 certification is expected of all "Q1," or preferred, production suppliers as well as nonproduction supplier facilities if the supplier has a manufacturing site or a nonmanufacturing site with significant environmental impacts that ships products to Ford.

We are continually improving our systems for influencing the integration of sustainability throughout our supply chain. We began this process by requiring all of our Q1 suppliers to obtain ISO 14001 certification for implementing and following an environmental management system in their facilities. In 2006, we attained our goal of having 100 percent of our Q1 production suppliers gain ISO 14001 certification for facilities supplying Ford. We also encourage our suppliers to extend the benefits of improved environmental performance by requiring their own suppliers to implement environmental management systems as well.

We work in cross-industry forums to encourage common approaches to the supply chain challenges of our industry. Since 2007, for example, we have been a member of the Suppliers Partnership for the Environment, an innovative partnership between automobile original equipment manufacturers, their suppliers and the U.S. Environmental Protection Agency. This partnership works to create new and innovative business-centered approaches to environmental protection and provides a forum for small, midsize and large automotive and vehicle suppliers to work together, learn from each other and share environmental best practices.

In 2006, we introduced our Aligned Business Framework (ABF), a strategy for working more closely with key suppliers to lower costs and improve quality. As part of this framework, ABF suppliers commit to managing and assuring proper working conditions and responsible environmental management in their facilities and in their supply chain.

Our work with ABF suppliers to date has focused on providing support and resources to help them align with Ford's Code of Basic Working Conditions and implement supporting processes, including responsible environmental management systems. Ford has committed to providing suppliers with a range of support and assistance based on our experiences in this area. During the fourth quarter of 2009, we held sustainability sessions in Dearborn, Michigan, and Cologne, Germany, which were attended by senior management from Ford and our ABF suppliers. Topics covered in these meetings included internal training development guidance, best practice sharing from suppliers on the topic of responsible working conditions, and environmental management in their own operations and their suppliers' operations.

We also held a workshop discussion on carbon measurement and management in the automotive value chain. In 2010 we will be conducting a pilot project with a select group of our suppliers that will involve the collection and reporting of greenhouse gas emissions data (see the Climate Change section for more information).

RELATED LINKS

This Report:

- Suppliers
- Supply Chain Sustainability
- Climate Change
- Code of Basic Working Conditions

External Web Sites:

- ISO 14001

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Design for Life-Cycle Sustainability

We use a life-cycle approach to assess and minimize the total adverse impacts of our vehicles from a sustainability perspective – from raw materials extraction and transportation through manufacturing and use to end of life. This approach considers and works to minimize negative impacts upfront in product design decisions. Called Design for Sustainability, the approach is integrated and holistic, to ensure that we achieve a balance between environmental, social and economic aspects in our product development process.

We are continuing to advance how we apply DfS principles. For example, we have developed a Product Sustainability Index tool, which has been in use in our European product development operations since 2002. This tool helps us assess and find opportunities to reduce the impacts of our products over their entire life-cycle – including environmental impacts such as CO_2, societal questions such as pedestrian protection and economic issues such as cost of ownership. We are increasing our use of sustainable materials and eliminating undesirable materials. We are also working to reduce greenhouse gases and other emissions from our facilities and vehicles by developing cleaner and more energy-efficient production processes, improving the efficiency of our packaging and transportation logistics and introducing cleaner and more fuel-efficient vehicles. Downstream in our value chain, we are working with drivers to educate them on ways to increase fuel economy and reduce vehicle emissions through our eco-driving program. Upstream, we are working with our suppliers to increase the sustainability of our products throughout the supply chain.

The remainder of this Environment section reports on our efforts to improve the sustainability of our products, operations and supply chain. For more information on our development of fuel-efficient vehicle technologies, please see the Sustainable Technologies and Alternative Fuels Plan.

RELATED LINKS

This Report:

- Product Sustainability Index
- Operational Energy Use and Greenhouse Gas Emissions
- Logistics
- Delivering More Fuel-Efficient Vehicles
- Eco-Driving
- Supply Chain
- Ford's Sustainable Technologies and Alternative Fuels Plan

Quantifying Our Environmental Impacts

The first important step in improving the life-cycle impacts of our products is to understand the environmental aspects of our products and the potential environmental impacts associated with them.[1] The stages of a vehicle's life-cycle include materials production, parts fabrication, vehicle assembly, vehicle operation (including fuel production), maintenance and repair, and end-of-life disposal and recycling. While estimates vary depending upon the specifics of the vehicle analyzed, one cooperative, multi-industry analysis of a typical family sedan (a spark-ignited, gasoline-powered, Taurus-class family sedan weighing 1,532 kilograms (kg)) found that during its life-cycle:

- 960 gigajoules of energy are consumed
- 21,000 kg of hydrocarbon are consumed
- 60,000 kg of carbon dioxide are emitted

In that study, it was assumed that the vehicle was driven a total of 120,000 miles at an average metro/highway fuel efficiency of 22.8 mpg. The study also found that:

- Vehicle operation consumes 86 percent of the life-cycle energy
- Vehicle operation generates 87 percent of the life-cycle CO_2
- Vehicle production generates 65 percent of the particulates and 34 percent of the life-cycle sulfur dioxide

This is consistent with a recent review of life-cycle studies, in which it was found that the operational stage generally accounts for 80 to 90 percent of the total energy consumption and CO_2 emissions of conventional gasoline-powered vehicles, depending on the vehicle's material composition, average fuel efficiency and lifetime drive distance. For example, an ISO 14040 reviewed life-cycle assessment study of the Ford Galaxy and S-MAX confirmed that the vehicle's use phase consumes more energy and produces more CO_2 emissions than the vehicle's other life-cycle phases. Other impact categories are mainly dominated by the mining and materials production phases. These findings were confirmed in subsequent studies for all other models developed using our Product Sustainability Index.

1. *Environmental aspects* is a term used in the ISO 14001 framework to denote elements of an organization's activities, products and services that can interact with the environment. Potential environmental impacts include any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services. Local Ford facilities use corporate lists of environmental aspects and potential impacts to identify and amplify those aspects that apply to their operations.

RELATED LINKS

This Report:
Product Sustainability Index

Ford.co.uk:
Ford S-MAX
Ford Galaxy

External Web Sites:
ISO 14001

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Product Sustainability Index

Ford's European operations have been leading our efforts to incorporate the principles of designing for sustainability and the use of a life-cycle management approach. Ford began integrating Design for Environment principles into the product development process in the early 1990s. Initially we focused on designing our vehicles to facilitate end-of-life disassembly and recycling by taking into account the accessibility of parts to be disassembled, the type and number of different fasteners used and the marking of parts for easy identification. Based on several studies, however, it became clear that focusing on a single life-cycle phase (e.g., end of life) leads to sub-optimizations and potentially increased impacts in other life-cycle phases.

Since then, we have shifted our focus to include a more comprehensive life-cycle approach to improving the sustainability of our vehicles. This focus incorporates the material and component production phase and the use phase, as well as the end-of-life phase. Since 2002, we apply as a sustainability management tool the Product Sustainability Index, or PSI, in the development of all of our major new European vehicles. This tool follows a holistic Design for Sustainability approach that incorporates societal and economic aspects as well as environmental aspects[1] into our life-cycle analysis and design approach.

Ford's PSI tracks eight product attributes identified as key sustainability elements of a vehicle: life-cycle global warming potential (mainly CO_2 emissions); life-cycle air-quality potential (other air emissions); the use of sustainable materials (recycled and renewable materials); vehicle interior air quality (including allergy certification from TÜV Rheinland, a product testing organization); exterior noise impact (drive-by noise); safety (for occupants and pedestrians); mobility capability (seat and luggage capacity relative to vehicle size); and life-cycle ownership costs (full costs for the customer over the first three years).

The PSI process has been used to develop the 2006 Ford S-MAX and Galaxy, as well as the 2007 Mondeo, 2008 Kuga and 2009 Fiesta. As a result of using the PSI assessment system, all of these models have shown improvements in environmental, social and/or economic performance when compared to the previous models. The chart below shows specific performance and areas of improvement for each model. The PSI will be used on all future products developed by Ford of Europe. Detailed reports on the PSI analysis for these vehicles can be downloaded from Ford of Europe's Web site.

PSI Assessed Models Performance[2]

Measurement Method

Emissions of CO_2 and other greenhouse gases from raw material extraction to material, part, and vehicle production, driving period (150,000 km; incl. air conditioning) and final recycling/recovery (i.e., full vehicle life-cycle, cradle-to-cradle)

	Performance*	Better/worse than previous model
2006 Ford S-MAX 2.0L TDCi with DPF	39 metric tonnes CO_2	Similar
2006 Ford Galaxy 2.0L TDCi with DPF	40 metric tonnes CO_2	Similar
2007 Ford Mondeo 2.0-liter TDCi Diesel with DPF	37 metric tonnes CO_2	Better
2008 Ford Kuga	37 metric tonnes CO_2	No previous model
2009 Ford Fiesta ECOnetic, Diesel	21 metric tonnes CO_2	Better

RELATED LINKS

Ford.co.uk:

- Ford S-MAX
- Ford Galaxy
- Ford Kuga
- Ford Mondeo
- Ford Fiesta

External Web Sites:

- ISO 14001
- TÜV Rheinland

2009 Ford Fiesta, Petrol	30 metric tonnes CO_2	Better

Measurement Method

Summer smog-related emissions from raw material extraction to material, part, and vehicle production, driving period (150,000 km; incl. air conditioning) and final recycling/recovery (i.e., full vehicle life-cycle, cradle-to-cradle)

	Performance	Better/worse than previous model
2006 Ford S-MAX 2.0L TDCi with DPF	37 kg ethene	Similar
2006 Ford Galaxy 2.0L TDCi with DPF	37 kg ethene	Similar
2007 Ford Mondeo 2.0-liter TDCi Diesel with DPF	35 kg ethene	Better
2008 Ford Kuga	35 kg ethene	No previous model
2009 Ford Fiesta ECOnetic, Diesel	22 kg ethene	Better
2009 Ford Fiesta, Petrol	32 kg ethene	Better

Measurement Method

Use of recycled and natural materials

	Performance	Better/worse than previous model
2006 Ford S-MAX 2.0L TDCi with DPF	18 kg of non-metals	Better
2006 Ford Galaxy 2.0L TDCi with DPF	18 kg of non-metals	Better
2007 Ford Mondeo 2.0-liter TDCi Diesel with DPF	7.5% of non-metals	Better
2008 Ford Kuga	6% of non-metals	No previous model
2009 Ford Fiesta ECOnetic, Diesel	8.5% of non-metals	Better
2009 Ford Fiesta, Petrol	9% of non-metals	Better

	Performance	Better/worse than previous model
2006 Ford S-MAX 2.0L TDCi with DPF	Substance management, TÜV-tested pollen filter efficiency and allergy-tested label	Better
2006 Ford Galaxy 2.0L TDCi with DPF	Substance management, TÜV-tested pollen filter efficiency and allergy-tested label	Better
2007 Ford Mondeo 2.0-liter TDCi Diesel with DPF	Substance management; TÜV-tested interior and pollen filter efficiency	Better
2008 Ford Kuga	TÜV-tested interior and pollen filter efficiency	No previous model
2009 Ford Fiesta ECOnetic, Diesel	TÜV-tested interior and pollen filter efficiency	Better
2009 Ford Fiesta, Petrol	TÜV-tested interior and pollen filter efficiency	Better

Measurement Method

dB(A)

	Performance	Better/worse than previous model

2006 Ford S-MAX 2.0L TDCi with DPF	71 dB(A)	Better
2006 Ford Galaxy 2.0L TDCi with DPF	71 dB(A)	Better
2007 Ford Mondeo 2.0-liter TDCi Diesel with DPF	69 dB(A)	Similar
2008 Ford Kuga	72 dB(A)	No previous model
2009 Ford Fiesta ECOnetic, Diesel	69 dB(A)	Better
2009 Ford Fiesta, Petrol	72 dB(A)	Similar

Measurement Method

Complex method, structural stability, occupant safety, and pedestrian safety; active safety elements, etc. including Euro NCAP stars

	Performance	Better/worse than previous model
2006 Ford S-MAX 2.0L TDCi with DPF	Euro NCAP safety rating: 5 stars for adult occupant protection, 4 stars for child protection and 2 stars for pedestrian protection	Better
2006 Ford Galaxy 2.0L TDCi with DPF	Euro NCAP safety rating: 5 stars for adult occupant protection, 4 stars for child protection and 2 stars for pedestrian protection	Better
2007 Ford Mondeo 2.0-liter TDCi Diesel with DPF	Euro NCAP safety rating: 5 stars for adult occupant protection, 4 stars for child protection and 2 stars for pedestrian protection	Better
2008 Ford Kuga	Euro NCAP safety rating: 5 stars for adult occupant protection, 4 stars for child occupant protection and 3 stars for pedestrian protection	No previous model
2009 Ford Fiesta ECOnetic, Diesel	5-star Euro NAP rating for adult occupant safety; electronic stability control available for all versions	Better
2009 Ford Fiesta, Petrol	5-star Euro NCAP rating for adult occupant safety; electronic stability control available for all versions	Better

Measurement Method

Mobility service (including seats, luggage) to vehicle size; measured as vehicle shadow in m² and luggage areas in liters

	Performance	Better/worse than previous model
2006 Ford S-MAX 2.0L TDCi with DPF	10.25 m² shadow area, 1171 l luggage, 5 seats	Better
2006 Ford Galaxy 2.0L TDCi with DPF	10.4 m² shadow area, 435 l luggage, 7 seats	Similar
2007 Ford Mondeo 2.0-liter TDCi Diesel with DPF	9 m² shadow area, 530 l luggage, 5 seats	Better
2008 Ford Kuga	9.5 m² shadow area, 410 l luggage, 5 seats	No previous model
2009 Ford Fiesta ECOnetic, Diesel	7.5 m² shadow area, 295 l luggage compartment	Better
2009 Ford Fiesta, Petrol	7.5 m² shadow area, 295 l luggage compartment	Similar

Measurement Method

Sum of vehicle price and 3 years' service (fuel cost, maintenance cost, taxation) minus residual value

	Performance	Better/worse than previous model

2006 Ford S-MAX 2.0L TDCi with DPF	Approx. €22,100	Better
2006 Ford Galaxy 2.0L TDCi with DPF	Approx. €23,200	Better
2007 Ford Mondeo 2.0-liter TDCi Diesel with DPF	Approx. €18,300	Better
2008 Ford Kuga	Approx. €19,100	No previous model
2009 Ford Fiesta ECOnetic, Diesel	Approx. €13,000	Similar
2009 Ford Fiesta, Petrol	Approx. €11,000	Better

Ford of Europe published a detailed PSI report in 2006, soon after the launch of the first vehicles for which PSI had been used from the beginning of vehicle development. The PSI assessment system has also been reviewed and certified by outside experts. One study, conducted by experts in the area of life-cycle science and sustainability, found the PSI to be a design and analysis step that provides a full sustainability assessment and meets the requirements of ISO 14040, the international life-cycle assessment standard. PSI assessments of the 2006 S-MAX and Galaxy vehicles were certified by the International Organization for Standardization for life-cycle assessment improvements. This certification process also verified the overall PSI methodology used for all subsequent PSI-developed models.

1. ***Environmental aspects*** is a term used in the ISO 14001 framework to denote elements of an organization's activities, products and services that can interact with the environment.
2. PSI-rated models are only available in Europe.

Products

As a customer and product-driven company, our vehicles are the foundation of our business. Our products are also a major focal point of our environmental impacts and our efforts to reduce those impacts.

This section reports on the environmental aspects[1] of our products, from their design through their use to the end of their life-cycle. Specifically, we report on:

- The fuel efficiency of our products, as well as product-related greenhouse gas emissions
- Tailpipe emissions, including hydrocarbons, nitrous oxides, carbon monoxide and particulate matter that can contribute to smog formation and other air pollution issues
- Sustainable materials, including efforts to increase our use of recycled and renewable materials, improve vehicle interior air quality and eliminate substances of concern

According to the EPA, no automaker posted a larger fleet-wide gain in fuel economy between 2004 and 2009 than Ford. Based on EPA measurements, Ford's combined car and truck fuel economy has improved nearly 20 percent since 2004 – almost double the improvement of the next closest competitor.

1. Environmental aspects is a term used in the ISO 14001 framework to denote elements of an organization's activities, products and services that can interact with the environment.

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Fuel Economy and Greenhouse Gas Emissions

ON THIS PAGE

Our current fuel economy performance is discussed in this section. We are pursuing the development of new technologies with fuel economy benefits for the future, including additional hybrids, plug-in hybrids, battery electric vehicles, advanced diesel engines, hydrogen fuel cell vehicles and biofueled vehicles, as discussed in the Sustainable Technologies and Alternative Fuels Plan. Our climate change strategy and participation in public policy processes related to climate change and fuel economy are discussed in the Climate Change section.

Fuel Economy Performance – U.S.

For the 2009 model year, the Corporate Average Fuel Economy (CAFE) of our cars and trucks increased by 4.2 percent relative to 2008. Preliminary data for the 2010 model year shows a 3.2 percent improvement in CAFE for cars and a slight decline of 2.4 percent in CAFE for trucks as compared to 2009. The projected increase in CAFE for our cars is due to increased customer demand for the more fuel-efficient midsize cars, which rose by 18 percent. This includes increased demand for the newly introduced 2010 Fusion Hybrid. The projected decrease in CAFE for our trucks can be attributed to increased demand for standard pickup trucks, which is up by approximately 6 percent and for medium and large SUVs, which is up by 5 percent. These mix shifts can be seen in the charts below.

RELATED LINKS

This Report:

- Ford's Sustainable Technologies and Alternative Fuels Plan
- Climate Change
- Delivering More Fuel-Efficient Vehicles
- EcoBoost™
- PowerShift Transmission
- Fuel Economy and CO_2 Emissions Data

Vehicle Web Sites:

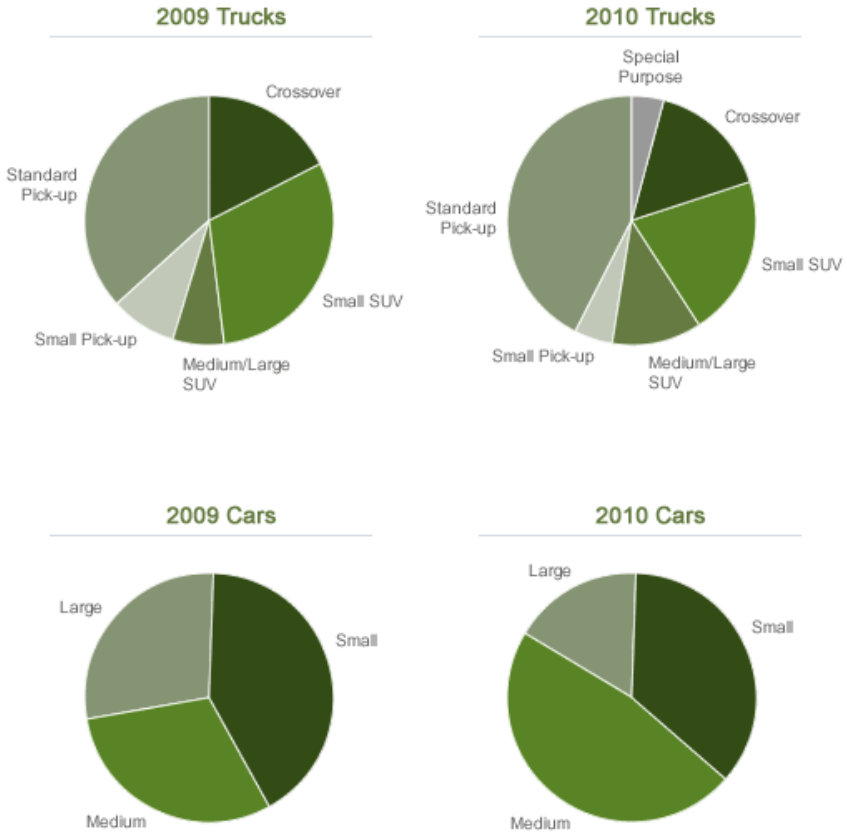
- Ford Focus
- Ford Fusion
- Ford Fusion Hybrid
- Mercury Milan
- Mercury Milan Hybrid
- Ford Escape Hybrid
- Mercury Mariner Hybrid
- Volvo V50
- Volvo C30
- Volvo S40

Ford.co.uk:

- Ford Focus
- Ford Mondeo
- Ford Fiesta
- Ford Transit Connect
- ECOnetic Vehicles

External Web Sites:

- www.fueleconomy.gov



Compared to the industry fuel economy average, Ford's 2010 MY U.S. vehicles rank better than average in four of ten categories, below average in two, and average in four. This can be seen in the Fuel Economy of U.S. Ford Vehicles by EPA Segment graphic.

According to the EPA, no automaker posted a larger fleet-wide gain in fuel economy between 2004 and 2009 than Ford. Based on EPA measurements, Ford's combined car and truck fuel economy has improved nearly 20 percent since 2004 – almost double the improvement of the next closest competitor. In addition, Ford's tailpipe CO_2 emissions are declining. Ford's fleet average CO_2 emissions have decreased (i.e., improved) 16 percent from the 2004 model year to the 2009 model year and are down approximately 5 percent from 2008.

In 2009, Ford committed that every all-new or redesigned vehicle we introduce will be best in class or among the best in class for fuel economy in its segment. Examples include the 2010 Ford Fusion and Mercury Milan hybrids, which, at 34/31 mpg, are fuel economy leaders in their class. Additional examples can be found in the section on Delivering More Fuel-Efficient Vehicles.

For the 2010 model year, we offered 10 vehicles that get 30 mpg or better, based on highway fuel economy estimates. These vehicles include the Ford Focus, Ford Fusion, Ford Fusion Hybrid, Mercury Milan, Mercury Milan Hybrid, Ford Escape Hybrid, Mercury Mariner Hybrid, and Volvo V50, C30 and S40 (see below). Compared to 2009, the number of 2010 vehicles that achieve 30 miles per gallon or better has increased.

2010 Ford Fusion

For more information on United States fuel economy regulations, please see the Climate Change section.

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Fuel Economy Performance – Europe

In Europe, the Ford brand achieved a significant reduction in average vehicle CO_2 emissions. These emissions decreased by 8.1 g/km from 2008 to 2009. This was largely due to a changed model mix, including selling a higher proportion of smaller cars, which was likely caused by the economic downturn in 2009. Since 1995, the Ford brand in Europe has reduced the average CO_2 emissions of the vehicles we sell by 27.1 percent. We have achieved these reductions by introducing a variety of innovations, including advanced common-rail diesel engines (which are available across our European lineup) and lightweight materials.

In 2008, we began launching our ECOnetic line of vehicles. These ultra-low-CO_2 versions of select Ford diesel vehicles, which are sold only in Europe, leverage several advanced fuel-saving technologies. The ECOnetic name was chosen because it links ecologically sensitive technology to our "energy in motion" design philosophy, which combines driving quality and emotional styling. Our ECOnetic cars use a combination of the latest common-rail diesel powertrains and other carefully selected features engineered to reduce CO_2 emissions to a minimum. These include: high-strength steels and other lightweight materials; electric power-assisted steering; an aerodynamics kit, including lowered ride height and aerodynamic details such as wheel covers and wheel deflectors; low-rolling-resistance tires; special low-viscosity transmission oil; and low-friction engine oils developed by Ford's fuel partner BP.

So far, we have launched ECOnetic versions of the Ford Focus, Mondeo, Fiesta and Transit. In 2010, we introduced the second-generation ECOnetic version of the Ford Focus, which emits only 99 g CO_2/km and achieves fuel economy of 3.8 L/100km. This performance was achieved by adding automatic start/stop technology and smart regenerative charging to the overall ECOnetic kit.

Our ECOnetic vehicles are being recognized for their significant improvements in fuel economy and CO_2 emissions. In December 2009, for example, the Ford Fiesta ECOnetic won the "Green Car of the Year Award" from TopGear magazine.

The following table highlights the fuel economy and CO_2 improvements and other benefits of the ECOnetic models introduced thus far.

Benefits of Ford's ECOnetic Models

Model	Fuel Economy[1] L/100km	CO_2 Emissions	Other Benefits
2010 Ford Focus ECOnetic, with 1.6-liter Duratorq® TDCi diesel engine and start/stop	3.8	99 kg/km	Best-in-segment CO_2 emissions for conventional powertrain
2009 Ford Mondeo ECOnetic, with 2.0-liter Duratorq TDCi diesel engine	5.2	139 kg/km	
2009 Ford Fiesta ECOnetic, with 1.6-liter Duratorq TDCi diesel engine	3.7	98 kg/km	Best-in-segment fuel economy; exempt from the UK's CO_2-based road taxes

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Fuel Economy Performance – Asia Pacific

In our Asia Pacific and Africa region we are focusing our near-term fuel efficiency efforts on implementing our EcoBoost™ engines and PowerShift transmission technology. In China, we will introduce the Ford Mondeo with an EcoBoost engine and PowerShift transmission in 2010. We expect this vehicle to be the best in its segment for fuel economy when it launches. In Australia, we will launch an EcoBoost version of the Ford Falcon in 2011. In our ASEAN markets, we will be launching the Ford Fiesta with a 1.6-liter Ti-VCT powertrain and six-speed PowerShift transmission[2]. This vehicle will be the first in the B-car segment to offer consumers this level of sophistication in powertrain technology, and it will be among the leaders in its segment in fuel economy. In India, we recently introduced the Ford Figo, which has highly fuel-efficient 1.4-liter TDCi diesel and 1.2-liter gas engine options. This introduction is very significant to our success in

India, as fuel economy is the most important criterion in purchase considerations in that country.

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Fuel Economy Performance – South America

In South America, we are improving fuel economy by introducing some of the efficient engine and transmission technologies currently used in North America, as well as by using technologies specifically relevant to the widespread use of biofuels in Brazil. For example, we have implemented improved engine compression ratios – i.e., the ratio at which the air and fuel mixture is compressed in the engine combustion chamber – on flex-fuel vehicles in Brazil. This optimizes fuel efficiency in vehicles using biofuels, which are higher octane than petroleum-based gasoline. We have improved the gearing ratios on our "B car" offerings – including the South American Ford Fiesta, EcoSport and Ka – which further improves fuel economy. We also made significant improvements to the aerodynamics of the South American Ka for the 2010 model year, further increasing fuel economy.

We are working on additional fuel economy improvements for future model years of vehicle programs that are currently under development. For example, we introduced a new more efficient engine on the 2010 South American Focus, which also will be used on the all-new 2012 EcoSport. This engine will improve efficiency compared to current engines through reduced internal friction and improved electronic throttle controls. For the 2012 model year and beyond, we are planning to introduce even more fuel-efficient twin independent variable cam timing engines and direct-injection engines, Battery Management Systems, smart alternator systems, dual-clutch automatic transmissions and improved aerodynamics.

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1. These fuel economy numbers are calculated according to the European Fuel Economy Directive EU 93/116/EEC, which uses European drive cycles. They differ from fuel economy calculations developed in the United States or other regions of the world.
2. Our ASEAN markets include Vietnam, the Philippines, Malaysia, Thailand and Indonesia.

ENVIRONMENT

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Non-CO_2 Tailpipe Emissions

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Vehicle smog-forming emissions result from the incomplete combustion of fuels, impurities in fuels, and the high-temperature oxidation of atmospheric nitrogen during the fuel combustion process. Regulated smog-forming tailpipe emissions include hydrocarbons, nitrogen oxides, carbon monoxide and particulate matter. These emissions are regulated in the United States by the Environmental Protection Agency under the Clean Air Act.

United States

In the United States, Ford completed the phase-in of the world's most comprehensive set of vehicle emissions requirements: the EPA's Tier 2 regulations. Tier 2 was fully phased in with the 2009 model year.

The Tier 2 program began with the 2004 model year. It coordinates the introduction of cleaner fuels with more stringent vehicle tailpipe emissions standards in order to achieve near-zero non-CO_2 tailpipe emissions from cars and light trucks. These regulations significantly reduce targeted vehicle emissions, including nitrogen oxides and non-methane organic gases, to help reduce the formation of ozone and particulate matter. The Tier 2 regulations apply to all passenger cars, light trucks and medium-duty passenger vehicles.

The comprehensive Tier 2 emissions program was designed specifically to address national air-quality issues in aggregate and includes targeted improvements in vehicle fuels. Because of this comprehensive approach, the Tier 2 program is more cost-effective and flexible than the state of California's program.

The results from the EPA's mobile source control programs, including the Tier 2 program, are impressive. The integrated and systematic approach has enabled significant reductions in smog-forming tailpipe emissions from our vehicles. By meeting these regulations, Ford has eliminated nearly 32 million pounds of smog-forming emissions from our light-duty fleet over the 2004 to 2009 model years. The EPA estimates that this program will reduce oxides of nitrogen emissions (from all relevant mobile sources) by at least 1.2 million tons by 2010.

For the California market, Ford is required to meet the state's stringent Low Emission Vehicle II (LEVII) emissions requirements for light-duty vehicles. Under the LEVII program, manufacturers are effectively required to produce a number of Partial Zero Emission Vehicles (PZEVs). A PZEV is associated with virtually zero vehicle emissions. Strictly speaking, PZEV vehicles are required to:

- meet California's Super Ultra-Low Emission Vehicle exhaust emissions standard (SULEVII),
- produce zero fuel system evaporative emissions, and
- be emissions compliant for a full useful life of 150,000 miles.

Ford's 2009 model year PZEV products included the Ford Focus, Fusion Hybrid and Escape Hybrid; the Mercury Milan, Mariner Hybrid and Sable; and the Volvo S40 and V50. For the 2010 model year, we will be offering a PZEV version of the Ford Focus; the hybrid versions of the 2010 Ford Fusion, Mercury Milan and the Lincoln MKZ will also meet the PZEV requirements.

To focus our resources most effectively in these difficult economic times, we have targeted an expanded role for technologies such as EcoBoost™ that deliver fuel-efficiency and emission

RELATED LINKS

This Report:

- EcoBoost™
- Non-CO_2 Tailpipe Emissions Data

Vehicle Web Sites:

- Ford Focus
- Ford Fusion Hybrid
- Ford Escape Hybrid
- Lincoln MKZ
- Mercury Milan
- Mercury Mariner Hybrid
- Volvo S40
- Volvo V50

External Web Sites:

- EPA Tier 2 Regulations
- California Air Resources Board Low Emission Vehicle Program
- EPA Green Vehicles Guide

benefits across our entire U.S. vehicle lineup. While introducing these new technologies, we are maintaining our commitment to the environment through the PZEV-compliant versions of products we make especially for the California market.

Information about the emissions performance of all Ford vehicles sold in the United States can be found at the EPA's Green Vehicles site.

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Europe

Since 1990, non-CO_2 tailpipe emissions from Ford vehicles sold in Europe have been reduced by up to 90 percent via the development of improved engine technologies (specifically diesel engines) and high-tech exhaust gas treatment devices. Ford of Europe has introduced diesel particulate filter systems on an increasing number of its new vehicles; we also have been installing these filter systems on older diesel-powered Ford vehicles, for owners who are interested.

Further air-quality improvements have been generated as we have introduced vehicles equipped with technology to meet the more-stringent Euro 4 and 5 emissions standards. All of our new passenger cars registered as of January 1, 2006, and all light-duty vehicles registered as of January 1, 2007, comply with the Euro 4 standard. In 2009, we started to introduce vehicles complying with Euro 5, which requires further reductions in nitrogen oxide (NOx) emissions and will be mandatory for all new vehicles registered from January 2011 onwards.

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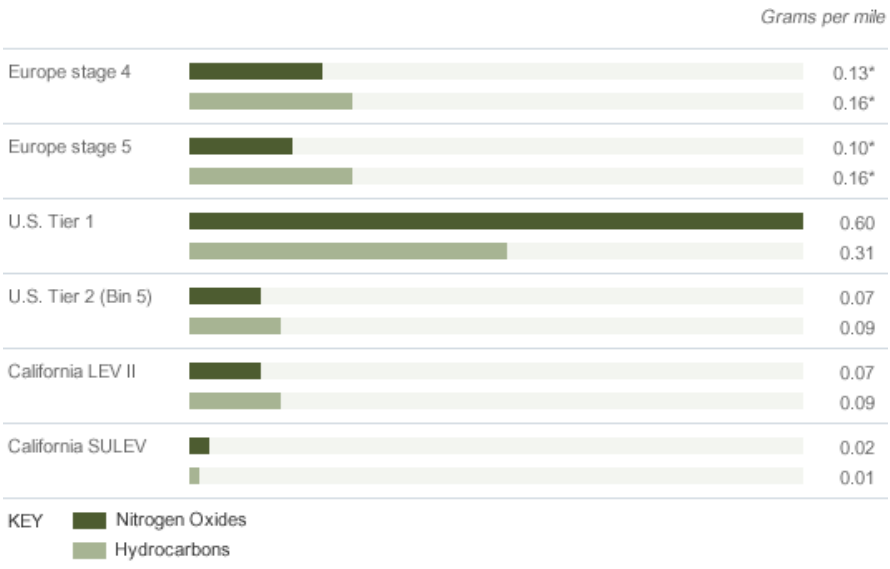
Emissions Regulations in the United States and Europe



Grams per mile

	Nitrogen Oxides	Hydrocarbons
Europe stage 4	0.13*	0.16*
Europe stage 5	0.10*	0.16*
U.S. Tier 1	0.60	0.31
U.S. Tier 2 (Bin 5)	0.07	0.09
California LEV II	0.07	0.09
California SULEV	0.02	0.01

* Standard for vehicles using gasoline as a fuel

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Sustainable Materials

Materials are an important element of a vehicle's life-cycle sustainability. Choices about materials can influence the safety, fuel economy and performance of the vehicle itself and can have implications throughout the value chain. A material can be more or less sustainable based on a number of factors, including its origin (virgin, renewable or reclaimed), the resources used and emissions produced throughout its life-cycle, and its application.

Ford has been working for many years to increase the use of recycled and renewable materials and reduce the use of undesirable materials. Vehicles in North America typically are composed of 20 to 25 percent post-consumer recycled material by weight, primarily due to the extensive use of metals with recycled content. Therefore, Ford has concentrated its efforts on developing new uses for recycled materials in the non-metallic portions of the vehicle, which are typically composed of virgin materials. While the amount of recycled content in each vehicle varies, we are continuously increasing the amount of recycled material used in each vehicle line. As described in the section on Design for Life-Cycle Sustainability, we use tools such as Design for Sustainability, life-cycle assessment and life-cycle costing to help make beneficial materials choices.

For many years, Ford has had a Voluntary Recycled Content Usage Policy, which sets targets for the use of non-metallic recycled content for each vehicle and increases targets year by year. Under this voluntary program, recycled materials have been selected for all of our vehicles whenever technically and economically feasible. Recycled materials are evaluated in-house versus comparable virgin grades, in order to guarantee appropriate mechanical properties and the same level of component performance that would be obtained with virgin materials.

We are now developing a comprehensive sustainable materials strategy to maximize the effectiveness and broaden the implementation of our efforts in this area. One of the key goals of this strategy is to identify and globally implement materials technologies that improve environmental and social performance and lower costs. To accomplish this, we are working with our commodity business planners and materials purchasers to communicate opportunities for the purchase of sustainable materials, develop and test pilot applications for new materials, and implement successful sustainable alternatives across multiple parts and vehicle lines. This process will standardize and broaden the use of sustainable materials in our vehicles. We are also developing global materials specifications, which will further facilitate the incorporation of sustainable materials where they meet performance requirements. By developing global specifications we will ensure that the benefits of more sustainable materials will have a global impact.

Whenever possible, we are introducing a recycled material specification into our virgin material specifications documents. This will simplify monitoring of the use of recycled content in our vehicles and will ensure that component engineers and Tier 1 Suppliers are confident in the recycled material, by means of a direct comparison with an equivalent virgin material.

A number of commodity purchasing plans already list recycled-content materials as a preferred material option, including those for battery trays, battery shields and wheel arch liners. For example, we developed a comprehensive resin strategy that requires the use of recycled plastics for underbody and aerodynamics shields, fender liners, splash shields, stone pecking cuffs and radiator air deflector shields manufactured in North America. Since 2009, these parts have been made out of post-consumer recycled waste from detergent bottles, tires and automotive battery casings. In 2010, we improved this strategy to specify the use of textile materials derived from 30 percent to 40 percent recycled content in the production of rear wheel liners. These fabric parts are 50 percent lighter than plastic wheel liners and absorb sound, which will enable improved noise vibration and harshness performance while potentially reducing the need for sound-deadening insulators, sprays and foams.

Many Ford vehicles already use recycled materials for these applications, including the Ford Flex, Focus, Fusion, Edge, Ranger, F-150 and Explorer; the Mercury Milan; and the Lincoln MKZ, MKX and Navigator. This recycled materials resin strategy saves money and reduces landfill waste. We

RELATED LINKS

This Report:

Design for Life-Cycle Sustainability

Vehicle Web Sites:

Ford Flex
Ford Focus
Ford Fusion
Ford Edge
Ford Ranger
Ford F-150
Ford Explorer
Mercury Milan
Lincoln MKZ
Lincoln MKX
Lincoln Navigator

estimate that Ford saved $4 million to $5 million in 2009 by using these recycled materials and diverted between 25 and 30 million pounds of plastic from landfills.

In addition, Ford has a material specification that defines ***post-consumer***, ***post-industrial*** and ***depolymerized recycled content*** and ensures that the use of in-house scrap is not counted towards recycling targets.

Choosing More Sustainable Materials

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We are working to improve the sustainability of our vehicles by using more sustainable materials. This includes increasing the use of recycled, renewable, recyclable and lightweight materials. Recycled materials incorporate post-consumer and/or post-industrial waste materials; renewable materials are made from plant-based materials; and lightweight materials use special materials and/or designs that provide the same or better performance as other alternatives with less weight.

Recycled Materials

We have focused our efforts to increase recycled materials on non-metallic parts, which traditionally have little or no recycled content. As described previously, we are mandating the use of post-consumer recycled materials in multiple exterior black parts as part of our comprehensive resin strategy. These materials were used in the underbody system of the 2009 Ford Flex, which won the Society of Plastics Engineers 2008 Vehicle Engineering Team Award for use of innovative materials. The Flex's **recycled plastic underbody system** uses approximately 20 pounds of post-consumer recycled waste per vehicle while reducing costs by 10 to 40 percent. We are also using post-consumer recycled carpeting in many exterior and under-hood parts that use nylon resins, including air cleaner housings, engine fans, fan shrouds, HVAC temperature valves, engine covers, cam covers and carbon canisters.

All of Ford's European vehicles use recycled polymers, where these are seen as contributing to a sustainable material supply and providing a more sustainable solution. The **European Ford Focus**, for example, uses a wide range of recycled material components, as follows.

- The battery tray is made of 50 percent recycled materials.
- The carpets contain approximately 20 percent recycled content.
- The heater and air conditioning housing contains 25 percent recycled content.
- The fan shroud contains 25 percent recycled content.
- The replacement bumpers are made from 20 percent recycled bumpers.
- The wheel arch liners are made from up to 100 percent recycled polypropylene.
- The air cleaner assembly is made from 25 percent recycled plastics.
- The fabric seat option is made from 100 percent recycled material.
- The roof lining, parcel shelf, instrument panel, insulation and soundproofing materials all include recycled textiles.

In the UK, we are also **recycling bumpers** that have been damaged in accidents or replaced in service. Ford dealers collect the bumpers, which are recycled into new bumpers and other plastic parts. Previously, dealers had to pay to dispose of these bumpers as waste. Now dealers store them in a container that is collected by Ford for free. One UK Ford dealer alone saved around £15,000 per year by participating in this project. In 2009, more than 23,000 bumpers across the UK Ford dealer network (equating to 70 metric tons of plastic) were diverted from landfill through this program.

In addition, we are using **recycled materials for interior and surface parts**. This can be much more challenging than using recycled materials for underbody, subsurface and exterior black parts, because it is difficult to get the necessary appearance and performance when using recycled materials. We are continuing to expand our use of recycled seat fabrics and seat

RELATED LINKS

This Report:

Ford's Sustainable Technologies and Alternative Fuels Plan

Vehicle Web Sites:

Ford Flex
Ford Fiesta
Ford Taurus
Ford Mustang
Ford F-150
Ford Fusion
Ford Escape
Ford Super Duty
Mercury Mariner
Lincoln MKS
Lincoln MKX
Lincoln MKT
Lincoln Navigator

Ford.co.uk:

Ford Focus
Ford Kuga

External Web Sites:

USCAR

components that meet all appearance and performance requirements. The following table highlights these efforts.

Interior Recycled Materials Achievements

Vehicle	Material	Partner	Benefits
2011 Ford Fiesta – North America	25% post-consumer yarns for seat fabric	Aunde	• Reduces consumer waste • Reduces depletion of natural resources
	75% post-consumer yarns for non-woven headliner	Freudenberg	
2010 Ford Taurus SHO	100% post-consumer yarns for seat fabric	Miko Fabrics	• Reduces waste • Reduces energy required for yarn manufacturing by 64% and manufacturing-related CO_2 emissions by 60% • Fabric manufacturing process uses only neutral, nontoxic dyes and no harmful solvents
2010 Ford Taurus SE	30% post-industrial yarns for seat fabric	Guilford	• Reduces consumer waste • Reduces depletion of natural resources
2010 Mustang Base Series	25% post-industrial yarns for seat fabrics	Sage Automotive Interiors	• Reduces consumer waste • Reduces depletion of natural resources
2010 F-150 XL, XLT & FX4	25% post-industrial yarns for seat fabrics	Sage Automotive Interiors	• Reduces waste • Reduces depletion of natural resources
2010 European Ford Focus RS (fabric option)	100% post-consumer yarns for seat fabric	Miko Fabrics	• Reduces waste • Reduces energy required for yarn manufacturing by 64% and manufacturing-related CO_2 emissions by 60% • Fabric manufacturing process uses only neutral, nontoxic dyes and no harmful solvents
2010 Ford Fusion and Mercury Milan Hybrids	85% post-industrial yarns and 15% solution-dyed yarns in seat fabric	Milliken	• Reduces energy use • Reduces CO_2 emissions • Reduces the use of dyes and chemicals • Reduces water use • Decreases the use of foreign oil
2010 Ford Fusion S series	27% post-industrial yarns for seat fabric	Guilford	• Reduces waste • Reduces depletion of natural resources
2010 Ford Escape and Mercury Mariner Hybrid and gas vehicles	100% post-industrial recycled yarns in seat fabric	Aunde	• Reduces waste, water use and CO_2 emissions
2008–2009 Ford Escape and Mercury Mariner Hybrids and gas vehicles	100% post-industrial recycled yarns in seat fabric	Interface	• Uses 600,000 gallons less water* • Produces 1.8 million lbs. less CO_2 equivalents* • Reduces electricity use by 7 million kWh*

* Based on an annual volume of 80,000 vehicles

Beginning in the 2009 model year, the **seat fabrics** in our new or redesigned vehicles will have least 25 percent post-industrial recycled content. In addition, many of our non-woven headliner fabrics now contain 50 to 75 percent recycled yarns, depending on their color.

In 2009, Ford joined a three-year research project investigating a new wood/plastic compound

known as "liquid wood." Early findings show excellent recycling potential, as the material can be reprocessed up to five times and has an overall near-neutral CO_2 balance.

We have expanded the use of recycled materials in several Class "A" decorative applications. For example, the 2011 Ford Super Duty® will use material derived from recycled battery casings on several aesthetic parts, such as license plate brackets, the 4x2's bumper valence panel and the fog lamp bezels. These parts are "molded in color" and color-matched to provide visual harmony. The Super Duty is also using post-industrial and post-consumer recycled plastic for its fascia lower valence. This plastic was a finalist for the 2009 Society of Plastics Engineers Innovation awards.

In most cases, plastics are "down-cycled" when they are recycled, which means that they cannot meet the original material specifications or use requirements of the virgin plastics from which they came. Our researchers are working on several projects that will recycle post-industrial recycled (PIR) and post-consumer recycled (PCR) plastic materials so they have the same level of quality and material specifications originally. For example, we are developing methods for recycling and cleaning PIR fascia and bumper scrap so that it can be molded into new fascias and bumpers. We are working to "upcycle" certain materials – that is, recycle it into uses with higher material and performance requirements than the virgin material. For example, we are working on upcycling post-consumer laundry and milk bottles into blow-molded automotive components. In addition, we are developing a method to recycle PIR and PCR polyurethane foam scrap to make new polyurethane foam components instead of landfilling it at the end of its life.

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Renewable Materials

We are actively researching and developing renewable material applications that will reduce our overall use of petroleum products and improve our carbon footprint, while providing superior performance. Research scientists at Ford's Research and Innovation Center in the United States, Ford's Research Center in Aachen, Germany, and Ford of Brazil are focused on developing automotive foams, plastics and composites that are derived from renewable resources.

Since 2002, our researchers have led the development of soy-based polyurethane foams for automotive applications. The manufacture of soy foam reduces carbon dioxide emissions, decreases dependency on oil and increases the utilization of renewable, agricultural commodities. Many technical difficulties had to be overcome to produce soy-based foams that met all durability and performance specifications. In 2007, Ford was the first automaker to implement this innovative technology (on the seat cushions and seat backs of the Ford Mustang), and we have since migrated its use to the Ford Expedition, F-150, Focus and Escape; the Mercury Mariner; and the Lincoln MKS and Navigator. In these vehicles, soy polyol replaces a portion of the standard petroleum-based polyol.

Ford currently has soy foam seats on more than two million vehicles on the road, which reduces petroleum oil usage by approximately one million pounds. Life-cycle analyses that compare soy foams with traditional petroleum-based foams show a net decrease of 5.5 pounds of CO_2 per pound of soy oil used. This results in a net decrease for Ford of greater than 5.3 million pounds of CO_2 annually, given our annual production of vehicles with soy foam seats. The soy foam used on the Mustang alone is expected to deliver a CO_2 reduction of 605,000 pounds annually.

Ford has been recognized for its leadership on soy foam technology through multiple awards, including the 2009 R&D 100 award from ***R&D*** magazine, which honors technologies across multiple industries that help to solve societal, scientific and/or business challenges. Additional awards for this material include the United Soybean Board's Excellence in New Uses Award (2006), the Society of Plastics Engineers' Environmental Division Award (2008), the Society of Automotive Engineers' International Environmental Excellence in Transportation Award (2008), and the Society of Plastics Engineers' Automotive Division Innovation Award in the Environment category (2008).

This year we have expanded our use of soy foam to include an industry-first application in headliners, which made their debut on the 2010 Ford Escape and Mercury Mariner. The soy-based headliner also provides a 25 percent weight savings versus a traditional glass-mat headliner.

Ford has licensed its soy foam technology to two companies – John Deere and Sears Manufacturing – that are investigating soy foam for seating applications in their agricultural equipment products. Soy foam not only uses a sustainable agricultural crop, but offers the potential for cost savings as well as stability from petroleum product price swings. Ford continues to collaborate with the United Soybean Board, which has sponsored research grants for new applications using soy products. For example, Ford scientists are currently assessing the use of soy meal, flour and hulls as fillers in synthetic rubber applications.

In 2009, Ford introduced the automotive industry's first application of **wheat-straw-reinforced plastic**. This material debuted in the third-row storage bins of the 2010 Ford Flex. Wheat straw is used to replace some of the glass fibers or talc materials commonly used to reinforce plastic parts. The use of wheat straw is a highly efficient use of natural fiber, because it is a byproduct of growing wheat that is typically discarded. Furthermore, the use of wheat straw-reinforced plastics in the 2010 Flex storage bins alone will reduce petroleum usage by some 20,000 pounds per year and CO_2 emissions by about 30,000 pounds per year. The material weighs up to 15 percent less than plastic reinforced with glass or talc. Additional implementations of wheat-straw-reinforced plastics under consideration by the Ford team include center console bins and trays, interior air registers, door trim panel components and armrest liners.

We are using **engineered wood technology**, which comes from a certified, sustainably managed forest and is a renewable resource, on several interior applications in North American vehicles. This wood, which is harvested under strict guidelines, is assembled into a composite and then stained to give it a warm, rich appearance. In addition, the use of engineered wood eliminates many of the extra processing steps necessary in producing real wood automotive trim parts, and the processing required is more environmentally friendly. For example, water-based stain can be used instead of solvent-based, and a solvent wash to remove oils is not needed. Additional bleaching and sealing operations are eliminated, which greatly reduces the production of volatile organic compounds. Engineered wood technology uses input materials more efficiently, so less waste material is sent to landfills. Engineered ebony wood was implemented on the 2008 Lincoln Truck, the 2008 and 2009 Navigator and the 2008 MKX. This technology will be used on the 2009 MKS.

In addition, we are using renewable materials on our **European vehicles**. For example, the Ford Mondeo uses a mixture of 50 percent kenaf plant fiber and 50 percent polypropylene in the compression-molded interior door panel. The average Ford vehicle sold in Europe uses between 10 and 20 kilograms of renewable materials, depending on the vehicle size class. Almost 300 parts used across Ford's European vehicles are derived from sources such as cotton, wood, flax, hemp, jute, and natural rubber.

For the future, Ford researchers are developing and formulating new materials and applications for other renewable materials, such as **corn-based, compostable and natural-fiber-filled plastics**. These materials will help to reduce the resource burden and waste generated by our vehicles and will help to reduce the weight of vehicles, thereby improving their fuel economy. For example, we are developing a sustainable replacement for the fiberglass now used between the headliner of a vehicle and the roof sheet metal. The replacement material is bio-based, reduces weight, improves acoustics and neutralizes odor.

We are also developing **natural-fiber composites** as a potential substitute for the glass fibers traditionally used in plastic automotive components to make them stronger. We are assessing the possibility of substituting up to 30 percent of the glass-fiber reinforcement in injection-molded plastics with natural sisal and hemp fibers. These parts have competitive mechanical and thermal properties and good surface appearance, and can be cost competitive. These natural-fiber-reinforced parts also reduce vehicle weight and life-cycle CO_2 emissions compared to glass-fiber-reinforced parts.

Finally, we are investigating ways to use plastics made entirely from sustainable resources such as corn, sugarcane and switchgrass. These **bio-based materials** could have multiple benefits, including reduced dependency on petroleum, reduced CO_2 emissions and the ability to compost instead of landfill materials at end of life. Ford researchers have made considerable inroads with polylactic acid (PLA) – a biodegradable plastic derived completely from the sugars in corn, sugar beets, sweet potatoes and other vegetables. When plastic parts made from PLA reach the end of their useful life, they can biodegrade in 90 to 120 days. In contrast, traditional petroleum-based plastics are projected to remain in landfills for hundreds of years. We are also assessing bio-yarns for use in making plant-based fabrics.

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Lightweight Materials

We are actively pursuing the development of cutting-edge materials to reduce the weight of our vehicles and improve their fuel economy without compromising safety or performance. For example, we are using **nanotechnology** to develop advanced lightweight materials that will allow us to decrease vehicle weight without sacrificing strength, safety, or performance. Much of this work focuses on developing the ability to model material properties and performance at the nanoscale, which will allow us to develop better materials more quickly and with lower research and development costs.

For example, Ford researchers recently implemented **virtual aluminum casting**

technology, which uses nanoscale modeling of one commonly used aluminum alloy to improve the performance and reduce the costs of lightweight aluminum engine blocks. We are continuing our work with Boeing and Northwestern University, begun in 2007, to expand nanoscale modeling to other alloy types. This research will allow Ford to develop and implement better lightweight materials and significantly reduce the research, testing and prototyping costs and time required to bring these new materials to production vehicles. This technology will advance Ford's goal of utilizing more recycled and recyclable materials by improving our ability to incorporate recycled aluminum without compromising the materials' performance characteristics.

In addition to this modeling work, Ford is experimenting with **nano-filler materials** in metal and plastic composites to reduce their weight while increasing their strength. For example, we are developing the ability to use nano-clays that can replace glass fibers as structural agents in reinforced plastics. Early testing shows that plastic reinforced with 5 percent nano-filler instead of the typical 30 percent glass filler has strength and lightweight properties that are better than glass-reinforced plastics.

Ford is working to understand the health and safety issues that may be posed by nano-materials. Ford has joined with other automakers under the United States Council for Automotive Research (USCAR) umbrella to sponsor research into nano-materials' potential impact to human health and environmental impacts. This research has addressed many health and environment-related questions so that we can focus our nano-materials research and development in areas that will be most beneficial.

Ford researchers are investigating **new types of steel** that are up to three times stronger than current steels and improve manufacturing feasibility because they can be formed into parts more easily. We are investigating polymeric plastic strengthening foams that are strong enough to stabilize bodywork in an accident but are light enough to float on water. These foams are being used to reinforce sections of the steel auto body, such as the B-pillars. In addition, we are working on surface coatings that reduce engine friction and remain intact even under the most adverse conditions.

Ford is increasing the use of **aluminum and magnesium** to reduce vehicle weight. For example, we implemented a new liftgate on the 2010 Lincoln MKT that combines a lightweight, die-cast magnesium inner panel with two stamped aluminum outer panels. This liftgate is more than 20 pounds, or 40 percent, lighter than a similar part made from standard steel.

In Europe, we launched a lightweight liftgate inner panel on the 2009 Ford Kuga, which reduced weight compared to a steel liftgate inner panel by 40 percent and reduced costs by 10 to 20 percent. This liftgate inner panel was a finalist for the Society of Plastics Engineers' 2008 Chassis/Hardware/Powertrain Innovation Award. Ford researchers in Europe are also developing alternative (copper-based) wire harness technologies that will enable significant weight reductions.

The European Fiesta stands on virtually the same footprint as the previous model, but weighs approximately 40 kilograms less, depending on engine choice, even after adding 10 kilograms of safety features and sound insulation. The use of **high-strength steels** – cold-and hot-formed – were the key to delivering the lighter weight and higher strength we needed for structural efficiency and crash performance. The materials used on the new Fiesta are setting a new benchmark in the small car segment.

Weight reduction alone may have relatively small impacts on fuel economy. By itself, a 10 percent reduction in weight results in approximately a 3 percent improvement in fuel efficiency. However, if vehicle weights can be reduced substantially, it becomes possible to downsize the powertrains required to run the vehicle. Weight reduction combined with powertrain rematching not only improves fuel economy, but helps maintain overall performance (compared to a heavier vehicle with a larger engine).

For more information on our weight-reduction activities, please see the Sustainable Technologies and Alternative Fuels Plan.

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1. Based on an annual volume of 80,000 vehicles

TOOLBOX

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Improving Vehicle Interior Air Quality and Choosing Allergy-Tested Materials

At Ford, we regard it as our corporate social responsibility to develop and offer products that are safe, sustainable and progressive. As part of this effort, Ford is proactively addressing society's growing concern about air quality and allergies. Consistent with our ONE Ford global integration process, a global cross-functional team focuses on selecting interior materials to reduce the risk of allergies and volatile organic compounds and works with suppliers to verify that we meet voluntary initiatives through rigorous scientific testing. This team is committed to investigating and developing comprehensive global approaches and strategies to address issues relating to vehicle interior air quality. The team has established global design guidelines for materials and filtration and is migrating those guidelines across Ford's product line.

Ford of Europe vehicles were the first vehicles worldwide to be awarded an "allergy-tested interior" certification by TÜV Rheinland, a Germany-based organization that controls and approves quality standards for industrial and consumer products. To obtain this certification, components in the vehicle interior must meet strict requirements focused on three key areas: measuring and meeting standards for the in-vehicle concentration of volatile organic compounds; minimizing the risk of allergic reactions; and high-efficiency air filtration. The requirements for minimizing the risk of allergic reactions include ensuring that no substances with allergenic potential (e.g., latex, nickel, chromium VI) are used for components that are likely to have contact with people's skin. They also require the use of an efficient pollen filter to protect passengers against allergenic particles in the outdoor air. Eight of Ford's European models have met these requirements: the new Fiesta, the European Focus (including the Focus Coupe-Cabriolet), the C-MAX, Kuga, S-MAX, Galaxy and Mondeo. In February 2008, the Berlin-based European Center for Allergy Research Foundation awarded Ford with its quality certificate – an additional recognition of the Company's "allergy-tested interior vehicle" initiative.

RELATED LINKS

Ford.co.uk:

Ford Fiesta
Ford Focus
Ford C-MAX
Ford Kuga
Ford S-MAX
Ford Galaxy
Ford Mondeo

External Web Sites:

TÜV Rheinland
European Centre for Allergy Research Foundation

TOOLBOX

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Eliminating Undesirable Materials

For more than 20 years, our Restricted Substance Management Standard has spelled out materials to be avoided or eliminated in Ford operations and in the parts and materials provided by suppliers. This and other materials management tools are helping us to meet and exceed customer expectations and ensure compliance with regulations.

Eliminating Mercury

Ford has decreased the use of mercury-containing components, which can pose problems at the end of a vehicle's life. In 2001, we eliminated mercury-containing switches, which accounted for more than 99 percent of the mercury used in our U.S. vehicles. Since that time, we have continued to focus on mercury reduction by working to eliminate this substance in the remaining mercury-containing components, including high-intensity discharge headlamps, navigation system screens and family entertainment system screens. As of 2010, all Ford, Lincoln and Mercury vehicles in the U.S. are mercury-free, with the exception of select vehicles with entertainment system displays and the Lincoln Town Car, which uses mercury in its high-intensity discharge headlamps.

In addition, we have helped to forge a collaboration between the Environmental Protection Agency, states, auto dismantlers, auto scrap recyclers, steelmakers and environmental groups to recycle mercury switches from end-of-life vehicles. This effort was rolled out across the United States in 2007 and now has more than 9,000 participants joining the effort from the recycling industry. By the end of 2009, more than three tons of mercury from these switches had been recovered. An online database tracks the number of participants in the program as well as the number of switches collected by state.

Eliminating Chromium and Lead

Hexavalent chromium – "hex chrome" for short – is a corrosion coating (used, for example, on nuts, bolts and brackets in cars and trucks) that the U.S. Occupational Safety and Health Administration lists as a potential lung carcinogen. We did not wait for global regulations banning the use of hex chrome to take effect: we phased out its use worldwide. By 2007, Ford eliminated all hex-chrome-containing parts in Europe and North America. Replacement coatings have been thoroughly tested to ensure that they meet Ford's performance requirements.

In North America, Ford has completed the transition away from lead wheel weights. In addition, Ford's Customer Service Division no longer offers lead wheel weights for sale to dealers, but offers steel wheel weights in their stead.

Ford has joined the EPA and other stakeholders in a commitment to reduce the use of lead in wheel weights through participation in the National Lead-Free Wheel Weight Initiative. Through this initiative, Ford has shared its experience with lead wheel weight phase-out with aftermarket wheel balancers, and encourages all stakeholders to discontinue the use of lead in wheel weights.

Since mid-2003, Ford of Europe phased out lead in valve seats for all new vehicle models approved for launch in the European Union. Also in Europe, we phased out the use of lead wheel weights and reduced the lead content in aluminum in new and serviced vehicles in mid-2005, and phased-out lead in pyrotechnic initiators by mid-2006. We further reduced the lead content in aluminum in 2008.

Reducing Undesirable Chemicals

Ford is one of the first automotive companies to begin efforts to reduce a range of undesirable chemicals that are monitored by the European Union, U.S. and Canadian governments. These chemicals include hexabromocyclododecane (HBCDD), a chemical that has been identified as a substance of concern under the European Union's REACH regulations (Registration, Evaluation,

Authorization, and restriction of Chemicals). Ford is also working to reduce decabromodiphenyl ether (Deca-BDE), another substance of concern that the EPA has proposed to regulate. Ford is working to eliminate these substances ahead of the timelines defined by governmental regulations by working with suppliers to develop new and "greener" alternative materials that will make our products more environmentally friendly.

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End of Life

Automobiles are one of the most highly recycled consumer products in the world. All vehicles contain parts and materials – particularly iron, steel and aluminum – that can be recovered at the end of their useful lives. In North America, about 95 percent of vehicles that go out of registration are processed by a dismantler or scrap metal recycling facility, with 82 to 84 percent of the vehicle by weight recovered for reuse, remanufacturing or recycling.

In theory, end-of-life vehicles are nearly 100 percent recoverable. In practice, however, the cost in energy and labor to recover the final fractions often exceeds the value of the materials, and recent independently reviewed environmental studies suggest that such efforts offer no value to the environment. Ford focuses on achieving the highest economically viable and environmentally sound recovery percentage through a number of means, including selection of materials, labeling and providing information to dismantlers on materials and methods for treatment.

In the EU, automakers are required by EU Directive 2000/53/EC to ensure a cost-free take-back of vehicles (that they put on the market) at the end of their lives. This directive also requires that end-of life vehicles (ELVs) are treated in an environmentally responsible manner. Since 2002, Ford has been at the forefront of providing return networks in the EU member states that have established regulations. Ford now has ELV take-back and recycling networks for Ford brand vehicles in 16 EU markets and participates in collective ELV recycling systems in another ten. For example, Ford was the first major manufacturer in the UK to put in place a comprehensive plan that met the European Commission's ELV directive. By working with Cartakeback.com, Ltd., we now have a network of more than 150 facilities providing unrivalled convenience to the last owner for the professional take-back, receipt and treatment of end-of-life vehicles.

In May 2007, Ford became one of the first European automakers to be certified in compliance with ELV requirements by demonstrating to external authorities that the Ford processes properly manage the reusability, recyclability and recoverability aspects of vehicles. In 2008, the Ford Fiesta, Focus, Focus Convertible, C-MAX and Kuga were certified as reaching recyclability of 85 percent and recoverability of 95 percent.

Ford has participated in research into alternative treatments for end-of-life vehicles. Most of the plastic, foam and other non-metal vehicle materials end up being shredded. Most of this "auto shredder residue" (ASR) ends up going to landfill. We have been working to assess the environmental impacts of burning ASR for energy. Together with other European automotive manufacturers, we sponsored a fully ISO 14040-compliant life-cycle assessment that showed that – from a purely environmental point of view – using recycling ASR for energy recovery is as beneficial as recycling it.

RELATED LINKS

This Report:

Sustainable Materials

Ford.co.uk:

Ford Fiesta

Ford Focus

Ford C-MAX

Ford Kuga

External Web Sites:

Cartakeback.com

ISO 14001

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Operations

We have adopted a rigorous and holistic approach to reducing the overall environmental impacts of our manufacturing facilities. We have established global facility environmental targets that address the range of our environmental impacts, including energy use, emissions, water use and waste generation.

Every facility uses a detailed scorecard to report against environmental targets, so that we can track and accelerate improvements. Progress toward the targets is reviewed throughout the year by senior management at regular Business Plan Review meetings. In addition, these targets become part of the performance review metrics for every plant manager and regional manufacturing manager, as well as others in the management hierarchy up to the Group Vice President of Manufacturing and Labor Affairs. Our 2009 and 2010 targets and progress are shown in the Year-over-Year Environmental Targets chart.

To facilitate performance tracking, we launched the Global Emissions Manager database (GEM) in 2007. This industry-leading database provides a globally consistent approach for measuring and monitoring environmental data, which helps us track and improve our efforts to reduce water consumption, energy use, carbon dioxide emissions and the amount of waste sent to landfill. GEM also provides a library of environmental regulations relevant to each plant, significantly increasing the efficiency of tracking and meeting those regulations.

This section reports on our facilities' environmental performance, including energy use and greenhouse gas emissions, other facilities-related emissions (including volatile organic compounds), water use, waste reduction, sustainable land use and biodiversity, compliance and remediation.

Ford has reduced global energy consumption by 44 percent and water use by 62 percent since 2000.

RELATED LINKS

This Report:

- Operational Energy Use and Greenhouse Gas Emissions
- Facilities-Related Emissions
- Water Use
- Waste Management
- Sustainable Land Use and Biodiversity
- Compliance
- Remediation
- 2009 Year-Over-Year Environmental Performance Metrics and Goals
- Sustainability Governance
- Sustainability Management

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Operational Energy Use and Greenhouse Gas Emissions

Operational energy use and greenhouse gas emissions are inextricably linked. The majority of our facilities' energy comes from fossil fuel sources, hence operational energy use is an important source of our companywide GHG emissions. Our efforts to reduce energy use and increase the use of renewable energy are also part of our strategy to reduce our GHG emissions and overall climate impacts. (See the Climate Change section for a discussion of our climate change strategy and product goals.)

We have been a leader in facilities-related GHG and energy-use reductions, public **reporting of our GHG emissions**, and participation in **GHG reduction and trading programs**.

- In 2008, we were the first automaker to join The Climate Registry (TCR), a voluntary carbon disclosure project that links several state-sponsored GHG emissions-reporting efforts, including the California Climate Action Registry and the Eastern Climate Registry. As TCR members, we must demonstrate environmental stewardship by voluntarily committing to measure, independently verify and publicly report GHG emissions on an annual basis using TCR's General Reporting Protocol.
- We were the first automaker to participate in GHG reporting initiatives in China, Australia, the Philippines and Mexico. In late 2007, Ford of Mexico was recognized by the Mexican government for four consecutive years of participation in that country's voluntary GHG reporting program. Ford's first report was used as the template for subsequent reporting in that program.
- We voluntarily report GHG emissions in the United States and Canada.
- We were the first, and remain the only, automaker participating in the Chicago Climate Exchange (CCX), North America's first GHG emissions-reduction and trading program. Through the CCX, we have committed to reducing our North American facility emissions by 6 percent between 2000 and 2010.
- We were the first automaker to join the UK's Emissions Trading System, which required us to agree to GHG emissions targets for all of our UK-based operations. This system was predecessor to the current mandatory European Union Emission Trading Scheme.
- Since 2005, GHG emissions from our European manufacturing facilities have been regulated through the EU Emission Trading Scheme. These regulations apply to eight Ford and Volvo facilities in the UK, Belgium, Sweden and Spain.
- The U.S. Environmental Protection Agency issued a final rule on September 22, 2009, establishing a national GHG reporting system. Facilities with production processes that fall into certain industrial source categories, or that contain boilers and process heaters and emit 25,000 or more metric tons per year of GHGs, will be required to submit annual GHG emission reports to the EPA. Facilities subject to the rule were required to begin collecting data as of January 1, 2010, and submit an annual report for calendar year 2010 by March 31, 2011. Many of our facilities in the United States will be required to submit reports. Our proactive approach and early action on GHG reporting globally has prepared us for this new requirement.

Our participation in these reporting, emissions-reduction and trading schemes has played an important role in accelerating our facilities' GHG emissions reduction activities.

Ford has reduced **global energy consumption** by 44 percent since 2000 and reduced energy consumption per vehicle by 17.7 percent during the same period. In 2009, Ford improved energy efficiency in its North American operations by 4.6 percent, resulting in savings of

RELATED LINKS

This Report:

- Climate Change
- Emissions Trading
- Facilities-Related Emissions
- Award-Winning New Machining Process Saves Money, Time, and Resources
- Ford's Best in Powertrain Environmental Initiative Produces Impressive Results
- Operational Energy Use and CO_2 Emissions Data

External Web Sites:

- EPA Energy Star
- The Climate Registry
- Chicago Climate Exchange
- E.U. Emissions Trading Scheme

approximately $15 million. We measure energy efficiency in North America using our Energy Efficiency Index.[1] To drive continued progress, we have set targets to improve our facility energy efficiency by 3 percent globally and 3 percent in North America in 2010.

We reduced our total **facilities-related carbon dioxide emissions** by approximately 50 percent, or 4.8 million metric tons, from 2000 to 2009. During this same period, we reduced facilities-related CO_2 emissions per vehicle by 27 percent. We have set a target to reduce our North American facility GHG emissions by 6 percent between 2000 and 2010 as part of our Chicago Climate Exchange commitment. The Company has also committed to reduce U.S. facility emissions by 10 percent per vehicle produced between 2002 and 2012, as part of an Alliance of Automobile Manufacturers program. Ford has already achieved a target to reduce absolute emissions from UK operations by 5 percent over the 2002–2006 timeframe, based on an average 1998–2000 baseline.

The EPA and U.S. Department of Energy again recognized Ford's energy-efficiency achievements by awarding us a 2010 Energy Star Sustained Excellence Award, which recognizes Ford's continued leadership and commitment to protecting the environment through energy efficiency. This is Ford's fifth consecutive year winning this prestigious award. The Energy Star Sustained Excellence Award requires organizations to demonstrate proficiency through the management of projects and programs, data collection and analysis, and communication actions, including community outreach and active participation in Energy Star industry forums. Among the achievements recognized by the award is a 30 percent improvement in the energy efficiency of Ford's U.S. facilities since 2000, equivalent to the amount of energy consumed by 110,000 homes.

Since 2007, we have been using a **utility metering and monitoring system** to collect incoming electricity and natural gas consumption data for all Ford plants in North America. We use this near-real-time information to create energy-use profiles for all Ford facilities and to improve decisions about nonproduction shutdowns and load shedding, which involves shutting down certain pre-arranged electric loads or devices when we reach an upper threshold of electric usage. During 2009, this metering and monitoring system was essential in helping us to minimize energy use during extended production slowdowns and production shutdowns. By using this tool and other best practices, Ford's manufacturing facilities reached record lows in energy use.

Ford continues to use **energy performance contracting** as a financing tool to upgrade and replace infrastructure at its plants, commercial buildings and research facilities. Through these contracts, Ford partners with suppliers to replace inefficient equipment, funding the capital investment over time through energy savings. Projects have been implemented to upgrade inefficient lighting systems, paint-booth process equipment and compressed air systems, and to significantly reduce the use of steam in our manufacturing facilities. Since 2000, Ford has invested more than $220 million in plant and facility energy-efficiency upgrades.

Ford has also established a three-year global effort to consolidate and redesign its **data centers** using best practices identified by the DOE and EPA's Energy Star program. First, we are consolidating data centers to dramatically reduce the number of managed facilities and their total energy demand. By the end of 2010, we will have consolidated 20 existing centers into just six, a reduction of 70 percent. We are also "virtualizing" 2,000 servers into just 100 physical servers. These consolidations will result in a 90 percent reduction in power needs and a 95 percent reduction in cooling needs.

During this process we are changing the layout of our remaining data centers to maximize their energy efficiency. By directing conditioned air into equipment racks as opposed to cooling entire server rooms, expensive chilled air is used much more efficiently, and the load on building cooling equipment is reduced. We have also developed and implemented global data center design specifications, so that all new and remodeled data centers will meet high energy-efficiency standards. This three-year data center initiative is projected to yield $35 million in operational cost efficiencies.

In 2010, we implemented a **PC power management system** to power down all of our desktop and notebook computers at night. The system, which is based on the NightWatchman® software application from 1E, overcomes many barriers of other power-down systems by allowing overnight data processing as needed, integrating power management and software delivery, and allowing custom power management solutions. We predict that this program will reduce our annual energy costs by $1.2 million and our annual CO_2 emissions by 16,000 to 25,000 metric tons.

We have implemented a **network-controlled system on plant air compressors** in our powertrain and vehicle assembly plants. This industry best-in-class system significantly reduces energy consumption by improving the operational efficiency of large, centralized air compressors. It allows for the real-time collection of key performance data through an enterprise-wide, web-based data management tool. This data is then used to determine the overall efficiency of each system and identify savings opportunities. The savings opportunity reports are sent to plant managers, who can then initiate corrective actions. The system also allows for remote troubleshooting of the equipment, which can extend equipment life and reduce maintenance

costs. The system is also being used for remote operation of equipment at select facilities. As of January 2010, we had installed these systems at 29 plants on 181 compressors.

In addition, we are implementing a new paint process that eliminates the need for paint to cure after the prime coat. This technology, called "three wet," reduces CO_2 emissions by 15 percent and volatile organic compound emissions by 10 percent. For example, the three wet system produces 6,000 metric tons fewer CO_2 emissions per year compared to water-borne systems and 8,000 metric tons fewer CO_2 emissions per year compared to conventional high-solids, solvent-borne systems. In addition to these environmental benefits, this process maintains industry-leading quality and reduces costs. For example, three wet reduces paint processing time by 20 to 25 percent, which correlates to a significant cost reduction. The paint formulation contains new polymers and other additives to prevent running and sagging during the application process. Ford's laboratory tests show that this high-solids, solvent-borne paint provides better long-term resistance to chips and scratches than water-borne paint. In part due to the quality benefits of the three wet process, Ford tied for first place in the 2008 Global Quality Research System automotive quality survey for paint durability.[2] The process is expected to reduce costs per vehicle, because it allows the elimination of a spray booth and an oven, and the attendant energy costs required to run them.

We completed the installation of a full production enamel line using the three wet process at the Ohio Assembly Plant, which started production in March 2008. In 2009 Ford installed the three wet paint process at the Chennai plant in India and the Craiova plant in Romania. We are currently installing the process at the Cuautitlán Assembly Plant in Mexico, the new Chongqing plant in China and the Michigan Assembly plant in Wayne, Michigan, which is being retooled to produce the Ford Focus. We are continuing to evaluate additional plants for three wet conversion, as refurbishment actions are being planned in line with the corporate business plan.

In 2009, Ford continued to expand the use of a new parts washing system developed in partnership with our supplier ABB Robotics. Conventional parts washing systems remove dirt chemically by spraying parts with high volumes of water and detergent at low pressure. This system, in contrast, cleans parts mechanically by moving them in front of specialized high-pressure nozzles with a robotic arm. This new robotics-based system represents a significant leap forward in energy efficiency that also improves quality, flexibility, productivity and cost. It saves energy in part because, unlike previous systems, it does not require any heat. It also uses a much smaller water pump. Forty-seven of these new robotic washing machines are now in operation at Ford, and we have incorporated the technology as standard for all engine and transmission final wash applications, ensuring that the energy and cost savings will be realized by all future vehicle programs. Most recently, we implemented robotic parts washing at our Craiova and Cologne engine plants.

We are also capturing our own waste products and turning them into fuel. We have implemented "fumes-to-fuel" technology – which captures emissions from the painting process and uses them to generate electricity – in paint shops at three of our manufacturing facilities. This process cuts down on fossil fuel use and the resulting CO_2 emissions, as well as reducing emissions from our paint shops. For more information, please see the Facilities-Related Emissions section.

In Europe, our Dagenham facility has reduced its electricity usage per engine manufactured by 12 percent over the past two years. This improvement was achieved by decreasing the use of energy-intense operations, such as the generation of compressed air for handheld tools on the production line. In addition, high-energy use equipment was scientifically optimized on Dagenham's new engine manufacturing lines. This equipment requires 70 percent less energy per engine than was used on the existing lines. In 2007, Dagenham won national awards from two organizations – Business Commitment to the Environment and Business in the Community – for the facility's CO_2 reductions, energ efficiency efforts and other environmental actions.

Other efforts to improve the energy efficiency of Ford's plant operations include:

- Aggressively curtailing energy use during non-production periods
- Updating facility lighting systems by replacing inefficient high-intensity discharge fixtures with up-to-date fluorescent lights and control systems
- Installing automated control systems on plant powerhouses and wastewater treatment equipment to increase energy and process efficiency

1. The Index is "normalized" based on an engineering calculation that adjusts for typical variances in weather and vehicle production. The Index was set at 100 for the year 2000 to simplify tracking against energy efficiency targets.
2. The Global Quality Research System survey is undertaken for Ford by the RDA Group a market research and consulting firm based in Bloomfield Hills, Michigan

Renewable Energy Use

Ford is actively involved in the installation, demonstration and development of alternative sources of energy. In November 2009, for example, Ford began powering the Genk, Belgium, plant with two **wind turbines**. The turbines, which were installed by local energy company Electrabel, each have an output of two megawatts of power, or enough to power 2,500 private homes. The turbines will deliver a significant portion of the electrical power needed by the Genk plant, which produces the Ford Mondeo, S-MAX and Galaxy models.

Ford's Dagenham Diesel Centre in the UK was the first automotive plant in the world to obtain all of its electrical power needs from two on-site wind turbines, which have been in operation since 2004. A third two-megawatt wind turbine will be installed at Dagenham in 2010.

A few miles from Dagenham, Ford's Dunton Technical Centre is also powered by electricity from renewable sources. Since March 2009, electric power on the 270-acre site, which is home to a team of approximately 3,000 engineers, has been purchased from 100 percent renewable sources. The majority of the electricity, supplied by GDF, is sourced from a combination of **hydro, wind and waste to energy generation**, and replaces energy from traditional sources that would have produced an estimated 35,000 metric tons of CO_2 emissions annually.

Since 2008, Ford has been sourcing renewable electricity to cover the full electric power demand of its manufacturing and engineering facilities at its Cologne plant in Germany. This includes the electricity needed for the assembly of its Fiesta and Fusion models at the plant. In addition, our Cologne Merkenich Development Center implemented a **heat-energy reclamation joint venture** with the local utility RheinEnergie. In early 2009, the Cologne facility was connected to one of RheinEnergie's boiler houses via a 2.6 km pipe. This pipe transfers what was formerly waste heat to a heat exchanger, which then uses that heat to produce electricity. Through these initiatives, the Company has reduced its CO_2 emissions by 190,000 metric tons per year.

In Wales, Ford's Bridgend engine plant was the first site retrofitted with one of the largest integrated, grid-connected **solar/photovoltaic installations** at a car manufacturing plant in Europe.

In North America, examples of installed renewable-energy technologies include a **photovoltaic array and solar thermal collector** at the Ford Rouge Visitors Center. The adjacent Dearborn Truck Plant has a living roof system, which uses a thick carpet of plants to reduce the need for heating and cooling while absorbing rainwater. At the Lima Engine Plant in Lima, Ohio, a **geothermal system** provides process cooling for plant operations as well as air tempering for employee comfort. This system uses naturally cooled 40°F water from two abandoned limestone quarries located on the plant site. The installation cost was comparable to that of the traditional chiller and cooling tower design that it replaced. This award-winning project eliminates the emission of 4,300 metric tons of CO_2 each year. In addition, we are investigating the expansion of our existing reclaimed landfill gas installation at the Wayne Assembly Plant.

At our Michigan Assembly Plant, we are building a **smart renewable power storage system**. We are collaborating with DTE Energy to build this stationary, battery-based energy storage facility, which will have 750 kw generation capacity and 2 MWh of power storage. This project will provide vital knowledge from a real-world integration of renewable energy, smart-grid technologies and battery storage infrastructure. For more on this project, please see Ford's Green Partnerships with Federal and State Governments.

Facilities-Related Emissions

We report on a variety of facilities-related emissions in the Environment data section of this Web site. Also, the Operational Energy Use and Greenhouse Gas Emissions section discusses GHG emissions from facilities.

In this section, we focus on how we are reducing emissions of volatile organic compounds (VOCs) at our facilities. VOCs are a significant aspect of Ford's manufacturing operations due to the size and number of paint shops that we operate.

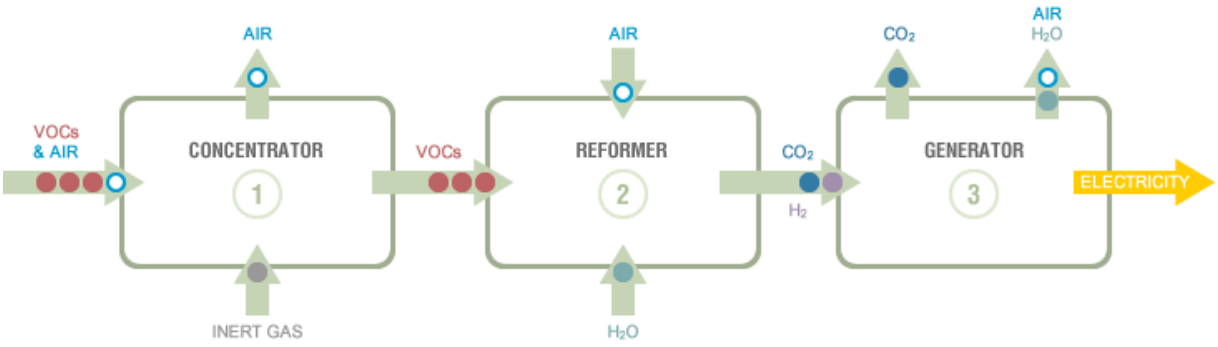
Since 2000, Ford's North American operations have cut the VOC emissions associated with the painting process (by far our largest source of VOC emissions) by more than 30 percent. In 2009, these operations emitted 21 grams of VOCs per square meter of surface coated. Because the control equipment used to reduce VOC emissions consumes significant amounts of energy, we have worked to identify innovative approaches to painting that meet cost, quality and production goals while allowing us to reduce energy use significantly and maintain environmental compliance.

In one innovative approach, Ford developed a "fumes-to-fuel" system in partnership with Detroit Edison. Initially tested at the Ford Rouge Center, the system concentrated fumes containing VOC emissions from solvent-based paint for use as fuel to generate electricity. The fuel was tested on a solid oxide fuel cell.

RELATED LINKS

This Report:

- Operational Energy Use and Greenhouse Gas Emissions
- Facilities-Related Emissions Data



Generating electricity from paint fumes

Move over the numbers above to see what happens at each stage.

1. CONCENTRATOR
   Strips air from paint fumes, leaving concentrated volatile organic compounds (VOCs)
2. REFORMER
   Ford-patented process converts VOCs to hydrogen gas
3. GENERATOR
   Uses hydrogen gas as fuel for fuel cell or conventional power plant to make electricity

A production-scale fumes-to-fuel system was installed as a pilot project at Ford's Michigan Truck Plant. The Michigan Truck pilot used a specially designed Stirling cycle engine that was more cost effective than a fuel cell. The engine produced about 50 kilowatts of electricity to help power the facility. The only byproducts of this system were small amounts of water vapor, CO_2 and nitrogen oxides. The Stirling engine also produced heat during combustion, which may be another useful source of energy in the future.

To further support Ford's research and development efforts, in 2009 a research facility was built at

our assembly plant in Oakville, Canada, with support from the Canadian government. This site contains a production-scale version of the fumes-to-fuel system including a fluidized bed adsorber-desorber, a VOC fuel reformer, a 300 kW molten carbonate fuel cell, and a120 kW internal combustion engine. The intent of this technology is to collect a portion of the VOCs from the spray booth exhaust, then super-concentrate the VOCs in fluidized bed concentrator, followed by condensing the VOCs for use as a fuel for either the120 kW internal combustion engine or as feed to the VOC reformer which would then be used in the 300 kW molten carbonate fuel cell. The fluidized bed adsorber-desorber as well as the 120 kW internal combustion engine are running as planned. This system is now being evaluated and optimized with research and development occurring on-site. In 2010, the VOC reformer will be brought online to determine if it can reform the VOCs into a form suitable for use in a commercially available 300 kW molten carbonate fuel cell from an operations, energy efficiency and economic perspective. Ford's fumes-to-fuel system, with or without energy generation, has the potential to reduce carbon dioxide (CO_2) emissions by 80 percent to 85 percent compared to traditional abatement equipment. A fumes-to-fuel system with energy generation using the fuel cell also has the potential to eliminate nitrogen oxide emissions.

Recently Ford formed partnerships with two leading-edge Canadian universities to help drive the research and development of this innovative technology, which will hopefully lead to further environmental CO_2 improvements and potential cost savings compared to traditional abatement equipment.

Moreover, we are reducing VOC emissions with an innovative paint process called "three wet." This process reduces VOC emissions by 10 percent and has other environmental, financial and quality benefits. For more information on three wet, please see the Operational Energy Use and Greenhouse Gas Emissions section.

TOOLBOX

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Water Use

A decade ago, Ford launched a water-reduction initiative and set a target of 3 percent year-over-year reductions in water use. We have exceeded this goal. From 2000 to 2009, Ford's global manufacturing operations reduced water consumption by more than 62 percent, approximately 10.5 billion gallons. We reduced global water use by approximately 16.6 percent from 2008 to 2009 alone. Per vehicle, we reduced global water use from 5.6 cubic meters per vehicle in 2008 to 5.2 cubic meters per vehicle in 2009.

In 2009, we began developing a new water strategy that addresses the impacts of our water use from both an environmental and a social perspective. To help guide and inform our approach, we signed on as a founding responder of the Carbon Disclosure Project's (CDP) Water Disclosure initiative, which launched in late 2009 to help institutional investors better understand the business risks and opportunities associated with water scarcity and related issues. The CDP's original project focused on corporate disclosures of greenhouse gas emissions and climate change strategies, and we found our participation in that project to be very beneficial in helping us formulate our strategy for GHG reporting. We anticipate similar benefits from CDP Water Disclosure, which will provide a globally harmonized method of water reporting. For more information please see Water: More Than Just Environmental Concerns.

This new strategy, which we are currently formulating, will build on the water use reduction strategy we began 10 years ago. When we initiated our water reduction goals in 2000, many facilities had little ability to track their water usage. Ford engineers thus developed a patented Water Estimation Tool (WET), a software program that helps facilities to predict their water usage. They then paired WET with WILD (Water Ideas to Lessen Demand), a list of practical ideas for reducing water use depending on where and when use is the greatest. Our facilities made good progress for several years, meeting or exceeding the 3 percent year-over-year water-reduction goal that applied to all facilities. To encourage continued progress, Ford environmental engineers are developing "single point lessons" that document practices demonstrated to save water. These lessons are cascaded for mandatory implementation in all facilities and are included in facility business plans. Single point lessons implemented thus far include leak identification, cooling tower optimization, and vehicle water testing.

Water use at each facility is also tracked in the Global Emissions Manager database, our global emissions management and tracking system. Water use is included in GEM in a monthly tracking scorecard reviewed by senior management.

In addition, we are using an innovative new machining process, called minimum quantity lubricant (MQL) machining, to reduce water use. In MQL machining, the cutting tool is lubricated with a very small amount of oil sprayed directly on the tip of the tool in a finely atomized mist, instead of with a large quantity of coolant/water mixture. The process saves hundreds of thousands of gallons of water per year. By eliminating the coolant/water mixture, MQL machining eliminates the need to treat and dispose of an oily waste stream. The MQL process is also delivering significant benefits in energy use, waste production, quality, working conditions and costs. We have already implemented the MQL system at a number of transmission plants in the United States, UK and Europe and are planning to use it at our Craiova, Romania, and Cologne, Germany, plants as we launch the production of new engines in these facilities.

Our Cleveland Casting Plant implemented significant water-reduction actions that focus on reducing water usage in the facility's large hydraulic units and electric induction, iron-holding furnaces, which were identified as major water-using sources in the plant. The project, which began in 2008, reduced water usage by 26.8 percent in 2008 and another 35 percent in 2009. Over the course of these two years, the project has saved more than $1.2 million in city water costs alone. The plant was named the winner of Ford's 2009 Environmental Leadership Award for its innovative water-saving efforts.

RELATED LINKS

This Report:

Water: More Than Just Environmental Concerns

Water Use Data

External Web Sites:

CDP Water Disclosure

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Waste Management

Ford's environmental goals include reducing the amount and toxicity of manufacturing-related wastes and ultimately eliminating the disposal of waste in landfills. Manufacturing byproducts include both hazardous and nonhazardous wastes. Ford has chosen to target eliminating the landfill of hazardous waste first, because this provides the quickest and most cost-effective benefits to human health and the environment.

In 2009, Ford facilities globally sent approximately 70,000 metric tons of waste to landfill, a decrease of 21 percent compared to 2008. Also in 2009, Ford facilities globally generated approximately 38,000 metric tons of hazardous waste, a decrease of more than 21 percent from 2008.

Seven of our facilities globally have achieved zero waste to landfill: the Windsor Engine Plant in Ontario, Canada; the Van Dyke Transmission Plant and Rawsonville Engine Plant in Michigan; the Cologne, Germany, manufacturing facilities, including the Engine and Vehicle Operations plants, technology development center and Ford Customer Service Division facility; the Saarlouis Body and Assembly Plant in Germany; and our assembly plant in India.

Ford India was declared winner of Ford's 2009 Asia Pacific and Africa Environmental Leadership Award for its "zero waste to landfill" initiative. The project was recognized as the leading green initiative in the region because it eliminates the disposal of materials to landfill and provides waste as an alternative fuel to the cement industry, thereby reducing demand for nonrenewable resources.

Managers at all of our plants strive continually to increase their waste recycling. Ford's Geelong foundry in Australia, for example, has developed processes to recycle foundry sand, scrap steel and process water. These recycling efforts are saving the plant almost $900,000 annually. The foundry is one of the few facilities in the world that does not buy any steel or pig iron from external recyclers. Instead, the facility uses recycled scrap steel generated by Ford's nearby stamping plant. To use this scrap steel, which has been coated with zinc rust-proofing materials, the foundry developed a new melting process that makes it possible to reuse the metal scraps without impacting the environment. The facility has begun to recycle process water in a closed-loop system that allows water to be reused again and again. The foundry also developed a process to separate metal and different sand components from used foundry sand. Metals are melted down and fed back into the foundry process, while used sands are shipped off for use in cement manufacturing and road building.

In 2009, our Ohio Assembly Plant formed a cross-functional team with the goal of reducing expendable packaging waste. This team consisted of staff from the facility's environmental, material planning and logistics, janitorial, purchasing, finance, and maintenance and production functions. The team targeted major waste streams such as shrinkwrap, fiberboard drums, baled cardboard, gaylord boxes and plastics. Process flows were created for each of these targeted streams, which enabled the team to identify obstacles to waste reduction and put action plans in place. Comparing the months of January through August, compactor waste was reduced by 20 percent from 2008 to 2009, and total waste to landfill was reduced by 31 percent.

In Europe, our Dagenham facility has implemented waste-reduction and increased recycling efforts that have prevented more than 12,600 metric tons of waste from being sent to landfills for disposal. For example, metal filings and other waste from the machining process are squeezed dry of lubricants and then sold as briquettes for recycling. In addition, 20,000 square meters of floor concrete removed to install new engine lines was reused in the flooring of the new production line.

Our Dunton facility in England has initiated a waste management contract whereby all site general waste materials (450 metric tons in 2009) are recycled via a "materials recovery facility" instead of going direct to landfill, resulting in at least a 90 percent recycling rate. Dunton continues to segregate and recycle 100 percent of metal, paper, wood, cardboard, vehicles and parts, as well

RELATED LINKS

This Report:

- Award-Winning New Machining Process Saves Money, Time, and Resources
- Ford's Best in Powertrain Environmental Initiative Produces Impressive Results
- Logistics
- Waste Data

as waste electrical and electronic equipment.

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Sustainable Land Use and Biodiversity

Our activities have the potential to affect land use, nature and biodiversity, directly and indirectly. Our real estate portfolio includes properties for manufacturing and office use. The construction and operation of these facilities have direct impacts on land.

Ford's most significant potential impacts on land and biodiversity are indirect, occurring elsewhere in our value chain or arising from the use of our vehicles. Indirect impacts include the extraction of raw materials to make vehicle parts, habitat fragmentation from road construction, localized pollution from vehicles and the potential effects of climate change on biodiversity.

Many of our facilities have taken steps to improve biodiversity and wildlife habitat on their lands, as follows.

Sustainable Landscapes

A highly visible example of Ford's commitment to sustainability can be seen on more than 200 acres of Ford-owned land throughout southeast Michigan, which is adorned with sunflowers, wildflowers, prairie plants and other non-turf grass plantings. This landscaping provides habitat for wildlife: for example, fox, wild turkeys and coyote have been spotted on Ford properties. This landscaping reduces mowing and other maintenance costs. By replacing what otherwise would be traditional turf grass, the Company saves approximately 30 percent on the costs of labor, gas and fertilizer.

Creating Wildlife Habitat

Ford has created wildlife habitats at many of its facilities. We are committed to maintaining our existing wildlife habitat sites and to creating new sites as possible in the future. Wildlife habitats on Ford facilities range in size from five to more than 100 acres and include ecosystems as diverse as wetlands, woodlands, prairies, meadows and forests. Ford employees, often in partnership with local civic and education groups, develop and maintain the habitats, which host dozens of native plant and wildlife species. At many of the facilities, employees and other volunteers have built nature trails, erected bird and bat houses and planted wildflower gardens, in addition to establishing wildlife habitats. These facilities have developed community education programs to encourage broader understanding of the importance of corporate wildlife sanctuaries.

In 2009, Ford's Romeo Engine Plant in Romeo, Michigan, was awarded a Neighborhood Environmental Partners Award from the Michigan Department of Environmental Quality for its work to build wildlife habitat on the plant site. Plant employees have worked hard to preserve and enhance the wildlife habitat available on the site's 141 acres, planting trees and building nest boxes to attract native birds, including bluebirds and screech owls. To promote habitat awareness and increase community participation, the Romeo Engine Plant's wildlife team organizes an annual tree sale and plant exchange, and plant employees organize clean-ups and other activities to celebrate Earth Day.

In addition, in February 2010 Ford and Automotive Components Holdings announced the donation of a coastal wetland in Monroe, Michigan, to the U.S. Fish and Wildlife Service. The property, known as Ford Marsh, will add 242 acres to the Detroit River International Wildlife Refuge. In addition, we have created large natural reserves at our facilities in Valencia, Spain, and Kocaeli, Turkey.

Our Mexican operations and dealers are working to protect wildlife habitat and biodiversity. For the last 13 years our Mexican operation's "civic committee" has been funding work to protect the peninsular pronghorn, an endangered species in Baja, California. This project has used captive breeding and reintroduction into the wild to increase the number of pronghorns. When the program first began, there were only 160 pronghorns in the area. A comprehensive field census is currently underway, but project managers estimate there are now nearly 900. This project has received global attention because it is one of the only species that has been successfully

reintroduced into the wild and is reproducing naturally in its own habitat. This project is managed by Espacios Naturales y Desarrollo Sustentable, a nonprofit organization, and Comisión Nacional de Areas Naturales Protegidas, the government office that oversees natural protected areas. The project also receives support from Animal Kingdom, the San Diego Zoo and other international wildlife organizations.

Our Mexican operation's civic committee is funding a communications campaign to raise awareness about the more than 150 natural protected areas in Mexico. The campaign is intended to foster understanding of the important services that these natural areas provide to communities, including air and water purification, food and wildlife habitat. So far, this project has produced several videos of natural areas that are shown in cinemas, airline TV programs, buses, airports and other locations. The project also includes a print campaign. We are planning to assist with a second phase of this project, which will focus on how people can help to protect natural areas.

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Green Buildings

Ford is a leader in green building, committed to the sustainable design of our facilities and landscapes using the basic principles of resource effectiveness, life-cycle assessment, health, safety and environmental performance. Ford is a member of the U.S. Green Building Council and a supporter of its green building rating system, known as LEED® (Leadership in Energy and Environmental Design). The LEED system includes a series of standards used for certifying buildings as "silver," "gold" or "platinum." It is recognized as the industry standard for green building. Ford employees who are involved in the design, operation and maintenance of commercial and manufacturing facilities have obtained LEED Accredited Professional certification, which demonstrates their proficiency in the application of the LEED rating systems. Having this expertise in-house will continue to strengthen our knowledge and the speed at which we apply environmentally sustainable technologies and processes at our facilities.

Ford is evaluating existing buildings to achieve LEED certification. The LEED Existing Building Rating System helps building operators measure operations, improvements and maintenance on a consistent scale, with the goal of maximizing operational efficiency while minimizing environmental impacts. The standards are intended to promote healthful and environmentally friendly buildings that are also durable, affordable and high performing by focusing on six key areas: sustainable site management, water efficiency, energy and atmosphere impacts, materials and resource use, indoor environmental quality and innovations in operations.

Ford is piloting the Existing Building certification process on Corporate Crossings, an office building that Ford developed in 1999 in Dearborn, Michigan. Based on the experience of certifying this building, Ford hopes to expand certification to other office buildings.

Ford is working to advance green building practices through partnerships with our building-related service providers. These partnerships help to educate service providers and provide a forum to exchange information on the concepts of sustainable design. For example, we have held training sessions on site selection, water efficiency, energy use reductions, sustainable materials and resources, and indoor environmental quality.

Green Housekeeping Program

Ford promotes the use of environmentally friendly products in the operation and maintenance of its facilities. One example of this is the continued expansion of our "green housekeeping" program. Through this program, we are working with our Tier 1 suppliers and contractors to promote the use of environmentally friendly cleaning practices and water-based products that help to reduce the impact of facility operations on the environment. Our cleaning service providers use highly concentrated, water-based chemicals with more efficient packaging, which significantly reduces product waste and the amount of fuel required to ship products. These green housekeeping practices are now in use throughout our North American manufacturing locations and commercial office buildings.

Ford Rouge Center

Ford's largest green building initiative is the redevelopment of the 600-acre Ford Rouge Center in Dearborn, Michigan, into a state-of-the-art lean, flexible and sustainable manufacturing center. The focal point of the center, the Dearborn Truck Plant, boasts a 10.4-acre living roof, part of an extensive stormwater management system that includes bio-swales and porous pavement to slow and cleanse the water. The Dearborn Truck Plant also features abundant skylights to maximize daylight in the facility. The Rouge Center features 100 acres of sustainable landscaping to help restore soils and support wildlife habitat.

Rouge Visitor Center (LEED-Gold)

The redeveloped Ford Rouge Center includes the LEED-Gold certified Rouge Visitor Center, a

RELATED LINKS

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Operational Energy Use and Greenhouse Gas Emissions

Sustainable Land Use and Biodiversity

External Web Sites:

Leadership in Energy and Environmental Design (LEED)

U.S. EPA Energy Star

30,000-square-foot facility featuring two multi-screen theaters and an observation deck. The facility uses rainwater for plumbing and irrigation, and solar panels to produce energy. In addition, "green screens" of shading vines cover some parts of the building in order to reduce energy use.

Fairlane Green (LEED-Gold)

Ford has developed a 1 million square foot green retail center on its 243-acre industrial waste landfill in Allen Park, Michigan, earning the national Phoenix Award for excellence in brownfield development. In addition, Fairlane Green Phase I received the nation's first LEED-Gold certification for a core and shell retail development, for its use of retention ponds for irrigation, sustainable landscaping and white roofs, and for the preservation of natural areas. The buildings feature high-efficiency heating and cooling systems, added insulation and weather sealing, and efficient windows and doors.

Product Review Center (LEED-Silver)

Ford's Product Review Center in Dearborn showcases Ford's latest products and green building principles. The LEED-Silver-certified building incorporates an innovative system to recycle water for irrigation and cooling, large windows to maximize daylight and extensive use of local and recycled materials.

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Compliance

Manufacturing Plant Notices of Violation

Ford received 12 notices of violation (NOV) from government agencies in 2009. Eight of the NOVs received were in the United States, two were in Britain, one was in Brazil and one was in Russia. The issuance of an NOV is an allegation of noncompliance with a regulation which could involve anything from a minor paperwork requirement to a permit limit, and does not necessarily mean that the Company was in noncompliance or received a penalty.

Offsite Spills

In 2009, offsite spills occurred at five Ford facilities in the United States and two in Britain. All required reporting and cleanup was completed in a timely fashion.

Fines and Penalties Paid

In 2009, Ford paid approximately $130,000 in fines or penalties globally pertaining to environmental matters in our facilities. The vast majority of this was paid to settle a civil administrative enforcement proceeding against the Company arising from the Sterling Axle Plant's disclosure of several potential violations of its air permits in 2008.

Remediation

Ringwood Mines Landfill Site

Ford Motor Company continues to address concerns raised in connection with Ford's prior disposal activities in New Jersey, including the adequacy of the prior investigation and cleanup of waste disposed by Ford. The Ringwood site was used for decades for the legal and illegal disposal of a wide variety of wastes by the Borough of Ringwood and other parties. Ford used the site to dispose of waste materials (primarily cardboard, wood wastes and paint sludge from the former Mahwah Assembly Plant) from 1967 to the middle of 1971. Ford previously participated in remediation activities at the site in the 1980s and 1990s. In September 2004, Ford entered into an Administrative Order on Consent and Settlement Agreement (AOC) with the U.S. Environmental Protection Agency regarding additional environmental activities at the Ringwood site. The EPA also requested the Borough of Ringwood's assistance in completing work at the site, and the EPA issued a Unilateral Administrative Order to the Borough regarding the Ringwood site. Ford is conducting further remedial work at the site pursuant to the AOC, all under the direction of the EPA and the New Jersey Department of Environmental Protection. It is anticipated that a new AOC will be signed later this year that will split the site into different operable units. The AOC will require Ford and the Borough to conduct feasibility studies and remedial designs for each of the operable units. Construction of the final remedies may begin in 2011.

Atlanta Assembly Plant

Ford's Atlanta Assembly Plant ceased operations on October 27, 2006. The property was then sold to Jacoby Development, Inc. (JDI) in June 2008. JDI completed demolition and soil remediation activities at the site under Georgia's Hazardous Site Reuse and Redevelopment Act and received a Limitation of Liability letter dated October 23, 2009. As part of the property sale, Ford retained responsibility for groundwater remediation.

In January 2009, the Georgia Environmental Protection Department (GEPD) approved Ford's Corrective Action Plan for groundwater remediation. The groundwater remediation work was then initiated with a pilot test to evaluate the efficacy of in-situ groundwater treatment by injecting sodium persulfate (a strong oxidant) into the ground via multiple injection wells. The groundwater data collected following the pilot test showed that while the sodium persulfate was capable of degrading hydrocarbons in the groundwater, the injection approach for treatment would likely not be able to meet remedial goals because of the complex hydrogeological conditions encountered at the site.

With the GEPD's approval, Ford selected a more aggressive remediation alternative. In October 2009, Ford initiated remedial activities to excavate to the groundwater table in two areas (Areas #1 and #2) and directly mix the sodium persulfate into the saturated zone. As of January 2010, this remediation mixing had been completed in Area #1 and was approximately 50 percent complete in Area #2. It is expected that the mixing in Area #2 will be completed in the second quarter of 2010, with only ongoing groundwater monitoring remaining.

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Supply Chain

As part of our life-cycle approach to sustainability, we work to improve the environmental, social and economic impacts "upstream" of our own manufacturing plants, including the impacts of transportation and logistics and the activities of our thousands of global suppliers. We work with our suppliers in a variety of ways to manage the impacts that occur when they provide us with goods and services.

In this section we discuss how we manage materials throughout our supply chain, our strategies to improve the logistics of parts transportation and packaging, and our other supply chain sustainability efforts.

Ford's supply chain sustainability efforts include developing tools and strategies to manage materials throughout our supply chain, reducing the environmental footprint of the transportation and packaging of parts and finished vehicles, and working with our core suppliers to improve the sustainability of their products and processes.

RELATED LINKS

This Report:

Suppliers

Our Value Chain and Its Impacts

ENVIRONMENT

- Progress and Goals
- Environmental Management
- Design for Life-Cycle Sustainability
- Products
- Operations
- Supply Chain
  - Materials Management Tools
  - Logistics
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Materials Management Tools

To manage materials across the vehicle life-cycle, Ford has developed a comprehensive set of processes and system tools called the Global Materials Management Program. These processes and tools assist us in communicating materials requirements to suppliers, and in tracking the materials that they use in the parts they manufacture. These tools include the Global Material Approval Process (GMAP), which handles all materials processed in Ford's plants; Global Material Integration and Reporting (GMIR), a materials tracking tool for our engineers and suppliers; and the International Material Data System (IMDS), a reporting system used by multiple automakers.

The IMDS was developed by seven auto manufacturers (including Ford) in 1997 to handle the tracking, review and reporting of all vehicle components and service parts from all suppliers. Twenty-six companies globally are now official members. The IMDS is a web-based system used internationally by suppliers to report on the substances and materials contained in parts for our vehicles. Ford has cooperated with other automakers to align reporting requirements for restricted substances and to analyze the data provided. This helps us to identify substances and materials of concern and target them for elimination.

To further help our suppliers manage their materials and substance data, Ford developed and launched GMIR. Through the GMIR Supplier Portal, Ford lists all the parts that require reporting by suppliers; we also list suppliers' reporting and certification status. Thus the system allows every supplier to monitor its reporting status and understand which parts are required to be reported. This two-way communication helps clarify a very complex materials management task and saves time and money for Ford and its suppliers. Thanks largely to the GMIR Supplier Portal, in 2009 Ford gathered more materials data from its suppliers than any other automaker. Ford uses the information obtained through GMIR to populate the IMDS. Ford vehicle programs reached an average of 93 percent of parts reported in the IMDS in 2009. Based on the data reported, Ford was able to certify that all affected vehicles meet end-of-life directives in the EU, South Korea and Japan.

For nondimensional materials (such as paint and adhesive) that are shipped directly to Ford plants, Ford launched GMAP – an electronic tool aimed at simplifying the global materials approval process. The GMAP process allows suppliers to use electronic transactions to submit their Material Safety Data Sheets and composition data. Internally, Ford approvers communicate their decisions of approval or rejection electronically. This new process saves time and ensures better-quality data for complying with government regulations and Ford policies.

In addition, Ford has developed systems to track and manage the use of chemicals, in response to the REACH chemicals management legislation implemented by the European Union in 2007. REACH stands for Registration, Evaluation, Authorisation and Restriction of Chemical substances. The goal of the REACH legislation is to improve the protection of human health and the environment through better and earlier identification of the intrinsic properties of chemical substances. All manufacturers operating in Europe must provide information on the properties and safe handling of their chemical substances to a central database in Helsinki. In addition, the legislation calls for the progressive substitution of the most dangerous chemicals, once suitable alternatives have been identified. REACH provisions will be phased in over 11 years.

Ford has taken a leadership position in implementing REACH. For example, Ford has been a key member of the Global REACH Automotive Task Force and was the first chair of this taskforce. Ford is also the chair of the North American Automotive Industry Action Group's REACH Advisory Committee.

Ford has made great progress in complying with REACH. For example, we created a REACH manager position and formed a REACH taskforce to manage relevant activities, including conducting REACH inventory studies and generating all required reports for customers and consumers. In addition, we have worked extensively with our suppliers to ensure their compliance with REACH thus far. Ford's existing Global Materials Management Program has made it much easier for Ford and our suppliers to comply with these new requirements. Using these systems,

RELATED LINKS

This Report:

- Sustainable Materials
- Suppliers
- Our Value Chain and Its Impacts

External Web Sites:

- IMDS
- REACH

for example, Ford conducted all of the "Substances of Very High Concern" inventory studies required by REACH and generated all required reports for consumers and governmental agencies. In addition, we have added all of the "Substances of Very High Concern" to our own Restricted Substances Management Standard: this ensures that we will get the necessary reporting from our suppliers. As a result of these efforts, Ford has the highest supplier response rate in the auto industry, and all of Ford's REACH-affected suppliers have committed to following REACH requirements through Ford's Global Materials Management Program.

More and more countries are adopting chemical and substance of concern regulations like REACH. Turkey and Romania adopted their own versions of REACH in 2009; China is planning to adopt its own version in October 2010; and the state of California is planning to implement the Green Chemistry law in 2011. Ford's Global Materials Management Program will provide an effective and efficient way for Ford to be a leader among auto companies in managing materials and meeting global chemical and environmental regulations.

Logistics

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- Waste Management
- Operational Energy Use and Greenhouse Gas Emissions
- Suppliers
- Climate Change

Ford's physical logistics operations provide the safe and efficient transport of parts from our supply base to our manufacturing plants (our "inbound" freight network) and of finished vehicles from the end of our assembly lines to our dealerships (our "outbound" freight network). Although logistics account for a relatively small percentage of total vehicle life-cycle emissions, we are working hard to maximize the efficiency of these operations to reduce both costs and environmental impacts. This work is managed by Ford's Material Planning and Logistics organization (MP&L), which is the department responsible for the design and operation of our global transportation networks and for engineering high-quality and efficient packaging to protect parts in transit.

SUMMARY OF FORD'S LOGISTICS-RELATED ENVIRONMENTAL ACHIEVEMENTS FOR 2009 AND 2010

- Reduced the road-based freight of parts and finished vehicles by increasing the use of rail and sea transport. (Switching from road to rail can save 40 percent of CO_2 emissions.)
- Reduced inland road-based transport within Spain by 29 percent by expanding from three sea ports of entry to six.
- Introduced a barge route between Romania and Bavaria and began using the Black Sea for imports into Russia.
- In North America, at the beginning of 2010, rail and intermodal rail shipments represented almost 40 percent of the network distance travelled, while accounting for less than 15 percent of the network carbon footprint. In North America, achieved an average of 8 percent fewer miles travelled by delivery trucks than at the end of 2009, and the network uses 70 percent rail miles and 30 percent road miles.
- Increased the use of alternative fuels and fuel-efficient driving practices on delivery vehicles.
- Implemented new packaging guidelines that require supplier-provided packaging to support corporate sustainability goals by seeking a neutral or positive environmental footprint through zero waste to landfill and the use of 100 percent recycled, renewable, or recyclable materials.
- Increased the use of reusable packaging containers to 90 percent in our European operations.

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CO_2 Footprinting

A key step in reducing logistics-related carbon dioxide emissions is understanding our current level of emissions, and being able to compare emissions of the various alternative transport routings. This data is increasingly required to support in-house reporting requirements, such as for our vehicle life-cycle emissions studies, and to support external reporting needs.

In 2008, MP&L established a global team specifically to address the climate change impacts of transportation logistics and in particular to generate metrics for CO_2 emissions. Since 2006, our European operations (in conjunction with our European Lead Logistics Partner DHL International) have been producing basic CO_2 metrics for our inbound network for both road and rail on a journey-by-journey basis, using CO_2 emissions factors available at the time. We are now expanding this work. During 2008 and 2009, Ford and DHL supported a Masters Project at Cologne University in order to investigate the best approach to calculate more-detailed freight-related CO_2 emissions. The original calculation method has now been greatly expanded to take into account the nature of different shipments and to include the latest-available emissions factors from the most widely recognized sources. In North America, we have developed a parallel process to generate CO_2 emissions data for our North American inbound freight network, and we have been reporting this data internally since January 2009.

As a further development, Ford's Transatlantic Lead Logistics Partner, UTi Worldwide, has developed a process for quantifying emissions from transatlantic ocean container freight, and is now calculating this data for Ford. Using this data, we began reporting on all inbound transport modes – rail, road and sea – in 2010. In 2010 we will start to generate metrics for outbound freight CO_2 emission reductions.

One of the key advantages of having transport emissions data available is that it can be used to study the impacts of different sourcing patterns. MP&L is actively supporting initiatives by the Purchasing department to develop mapping models for the entire supply chain for Ford's various vehicle lines, including both the transportation and manufacturing footprints in different source locations.

There is currently no fully agreed-upon international standard for CO_2 measurements for freight transport. We are working with many key organizations to help develop standards that are both comprehensive and practical to apply. For example, we are working with the World Resources Institute on road-testing their new "Scope 3" reporting standards, and we are actively participating in the UK Department for Transport's Low Carbon Transport Supply Chain Steering Group.

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Parts and Vehicle Transport

In the majority of cases, we collect parts from our suppliers rather than have the suppliers deliver parts to our assembly plants themselves. This allows us to optimize all deliveries and thus minimize the total amount of transport required. Our inbound network is fully integrated with regional distribution centers, so that material for different plants can be collected together and then cross-loaded onto trailers routed to different final destinations. Since 2008, we have integrated transatlantic freight into the domestic networks operated by Ford of Europe and Ford North America. This integration has resulted in a reduction in the number of vehicles collecting materials from shared suppliers. For example, when suppliers are located close together, "milkround" routes are established where a single truck may visit a number of collection points. The net effect of these strategies is to minimize the number and length of journeys required, which in turn significantly reduces the environmental impact of our transportation. We work in conjunction with our Lead Logistics Providers to regularly review shipping quantities and collection frequencies, with the aim of continuously optimizing the networks. For example, in 2009 our North American Material Logistics Network collected material from 2,204 different origins or suppliers and shipped them to 37 destinations or plants, and used four origin distribution centers – called "cross docks" – to optimize delivery efficiency.

In addition, to increase overall transport efficiency, we have implemented contracts that encourage our freight carriers to carry third-party freight on return journeys rather than returning home empty.

We are maximizing the use of rail, river and short sea transport for the transport of inbound parts and materials and outbound vehicles to reduce fuel costs, emissions and road congestion. The environmental impact of rail freight is significantly less than that of road freight. It has been estimated that switching from road to rail can save 40 percent of CO_2 emissions.

For some time we have made use where possible of traditional rail services. For example, we move material by rail between our Cologne logistics hub in Germany and our Transit plant at Kocaeli in Turkey, and we move engines by rail from our Bridgend plant in Wales to our Valencia plant in Spain.

It can be difficult to expand the use of rail freight because rail terminals are not always sited near the facilities from which and to which we need to make materials and parts deliveries. To overcome this difficulty, we use "SWAP bodies" – standard freight rail containers that can be lifted on to specialist road trailers. For example, we use this system for parts shipments from suppliers in Italy to our facilities in Genk, Germany. Using this approach, road-based truck trailers are lifted

onto railway wagons at Verona and pulled by train to Genk. We use a similar process to transport materials to Genk from suppliers in Scandinavia.

In 2009 we pioneered a number of new "inter-modal" routes that use a combination of road and rail transport in order to achieve the environmental friendliness of rail for long distances, and the flexibility of road transport at either end of the journey. One example of this combined road/rail route approach is our transport system from northern Spain and southern France to our Saarlouis facility in Germany. Using this system, standard truck trailers from suppliers in Spain are driven directly onto rail wagons at a special terminus at Perpignan, France, near the Spanish border, then carried by train more than 1,000 km to Luxembourg, from where they are taken by road to Saarlouis. This approach is not only more environmentally friendly, it also reduces road congestion: the train-based freight from Perpignan to Luxembourg has the potential to keep 40 truck trailers a day off the French roads.We also focus on using water-based transport in Europe as much as possible for outbound vehicle deliveries. Following this approach, inland road-based transport within Spain has been reduced by 29 percent by expanding from three sea ports of entry to six. Moreover, we have increased our use of river transport: we use barges from our Cologne facility to a number of ports to the north and south. In 2009 we introduced a barge route between Romania and Bavaria, and we now use the Black Sea for imports into Russia.

Actions by Ford of Europe to reduce the carbon footprint of its vehicle transportation logistics operation were recognized by a prestigious Supply Chain Distinction Award in 2009. The judges honored Ford of Europe for its unparalleled performance in environmental supply chain planning and execution. This includes compliance with environmental regulations, minimizing waste from the supply chain process and the overall adoption of "green" practices across the chain.

In North America, rail is used for efficient long-distance transport of commodities such as metal stampings and powertrains. A single 86 inch high cube railcar can carry cargo equivalent to three to four 53-foot truck trailers. At the beginning of 2010, Ford's rail and intermodal rail shipments represented almost 40 percent of the network distance traveled, while accounting for less than 15 percent of the network carbon footprint.

Our Finished Vehicle logistics team in North America has focused its recent carbon footprint reduction efforts on reducing the number of miles traveled per vehicle within the network, thereby lowering the amount of fuel consumed to deliver them. Today, vehicles travel an average of 8 percent fewer miles to their destination than they did at the end of 2009, and the network is an efficient 70 percent rail miles/30 percent road miles. This mix provides an effective blend of cost, speed to market and carbon emissions management, given North American geography. Although short sea and river barge transportation is not a significant green option in North America, the modernization of the transportation fleet with a view toward fuel efficiency is an objective of shippers and carriers alike. Our North American logistics operations are also focused on improving load density, or the number of vehicles carried per conveyance, as a means to lower the number of conveyances employed, and thereby reduce the amount of fuel consumed.

We are working to reduce transport-related emissions by reducing the emissions of freight trucks themselves. In North America we have partnered with the Georgia Institute of Technology to research a number of aspects of emissions reduction. For example, we are developing best-practice guidance for our carriers to identify equipment modifications that will reduce fuel usage. We share potential best practices and the results of internal testing at regular communications meetings with our carriers, and we survey carriers annually on their implementation of fuel-efficient practices. In addition, we have been working on practical applications for alternative fuel and engine technologies in our logistics activities, and have carried out a number of trials using our in-house transport fleets. Our Rawsonville Plant has signed up to the Environmental Protection Agency's "SmartWay" program, and is monitoring improvements to its truck fleet's fuel usage. Our North American operations also work to decrease the number of transport runs required by making improvements in packaging density and trailer cube utilization.

Ford of Europe's in-house transport operations have been implementing a number of initiatives to reduce the emissions of their trucks. These include training in fuel-efficient driving and increasing the use of biofuels. We are using a lower emission propane (liquefied petroleum gas) van for all London-based delivery work. Also, we use a fuel additive on major inbound routes to reduce harmful nitrous oxide emissions. Our European transport operations have tested the use of driving speed limiters to improve fuel economy and the use of deflectors on new trailers to improve vehicles' aerodynamics. These and other efforts have allowed us to comply with Euro V emission rulings and reduce our emissions-related road tax costs.

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Packaging

Ford MP&L's Packaging Engineering department focuses on designing, procuring and optimizing packaging on a part-by-part basis to best suit the components being moved and the transport

required.

Packaging directly impacts a number of environmental elements throughout its life-cycle, including materials usage, freight and waste disposal. Over years of testing, tracking and performance improvement, we have confirmed that the best strategy to eliminate material waste and optimize freight efficiency is to use durable and returnable packaging for all but the longest supply chains.

We have developed a standard range of packaging that not only protects parts and makes them easy to handle at the assembly line, but also allows maximum storage density during transportation, thereby minimizing transport requirements. We review the packaging of production trial parts to assess opportunities to increase packing density prior to the full-volume launch of a product.

One of the benefits of standardizing packaging is that it makes packaging interchangeable between suppliers and programs. In Europe, we have contracts with third-party specialist packaging providers to control the issue, collection and pooling of standard packaging for our suppliers. This pooling greatly reduces transport requirements, as the packaging can be shipped to where it is next required rather than always having to return it to the supplier who last used it.

Currently, our European operations use 90 percent reusable containers, and we are seeking to increase that amount. For example, we are working to develop more direct routing for parts to our St Petersburg plant so that it is viable to use returnable packaging.

Our Asia Pacific and Africa team is investigating the use of returnable packaging for hazardous material shipments, to ensure that they meet transportation requirements and will reduce waste.

We are now working globally to share best practices between regions and to drive consistency in packaging for future global vehicle programs. Ford's latest packaging guidelines, published in April 2009, require that supplier-provided packaging supports corporate sustainability goals by seeking a neutral or positive environmental footprint through zero waste to landfill and use of 100 percent recycled, renewable or recyclable materials.

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TOOLBOX

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- Download files

Supply Chain Sustainability

We are working with our core suppliers to improve the sustainability of their products and processes. Our work with our Aligned Business Framework (ABF) suppliers to date has focused on providing support and resources to help them align with Ford's Code of Basic Working Conditions and implement supporting process, including responsible environmental management systems. Ford has committed to providing suppliers with a range of support and assistance based on our experiences in this area.

For example, during the fourth quarter of 2009, we held two sustainability sessions in Dearborn, Michigan, and Cologne, Germany, which were attended by senior management from Ford and our ABF suppliers. Topics covered in these meetings included internal training development guidance and best practice sharing from suppliers related to responsible working conditions and environmental management in their owned operations as well as with their suppliers. We also held a workshop discussion on the topic of carbon measurement and management in the automotive value chain. We are now working with our suppliers to improve environmental performance and have begun to engage with suppliers in the data collection and reporting of greenhouse gas emissions (see the Climate Change section for more information).

We are also working with our suppliers to increase their use of sustainable materials and eliminate undesirable materials. While Ford has already made great strides in using more sustainable materials (as discussed in the Sustainable Materials section), we can expand these efforts by systematically working with our suppliers on sustainable materials. Toward that end, we are developing Commodity Business Plans and other materials purchasing strategies that require the use of sustainable materials. For example, we developed a purchasing strategy for recycled plastics resins and Commodity Business Plans for relevant parts that require the use of post-consumer recycled plastics. Beginning in 2009, underbody aerodynamics shields, front splash shields, stone pecking cuffs and radiator air deflector shields manufactured in North America are made from the approved recycled plastics or ultra-lightweight, sound-absorbing textile materials with 30 percent to 40 percent recycled content.

In Europe and North America, we have added environmental requirements to the formal agreements that we make with our suppliers. These requirements cover a range of issues, such as reducing materials of concern, using Design for Sustainability principles, increasing the use of sustainable materials and using materials that will improve vehicle interior air quality. We ask suppliers to use recycled materials whenever technically and economically feasible. All recycled materials are evaluated in-house to guarantee that they deliver appropriate mechanical properties and the same level of performance that would be obtained with virgin materials.

Sales and Service Sustainability Initiatives

In early 2010, Ford announced a new dealer sustainability program. The "Go Green" Dealer Sustainability Program is a voluntary initiative for Ford and Lincoln Mercury dealers to reduce their carbon footprint and improve the energy efficiency of their dealerships. Through this program, Ford will collaborate with dealers to implement cost-effective ways to improve the energy efficiency of their facilities, resulting in a long-term reduction in the individual dealership's carbon footprint as well as overall operating costs.

Dealers who participate will first receive a comprehensive energy assessment from sustainability experts at Ford. After the thorough assessment is completed, Ford and the dealer will work together to identify the best energy-saving options that are available and tailor a program to meet the needs of the dealer. Possible solutions are wide-ranging and can be implemented for dealers with existing facilities, as well as dealers who are constructing new facilities. Participating dealers will receive guidance on available state and federal tax credits and incentives, as well as access to technical expertise and resources to assist with the selection of energy-efficient products and equipment.

Ford has partnered with the Rocky Mountain Institute to pilot emerging technologies and

RELATED LINKS

This Report:

- Suppliers
- Sustainable Materials
- Code of Basic Working Conditions
- Climate Change
- Dealers

External Web Sites:

- Rocky Mountain Institute

advanced facility design strategies at the pilot dealerships in varied climate locations. The first pilot project, which is being conducted at Jarrett Gordon Ford Lincoln Mercury in Winter Haven, Florida, involves a major renovation incorporating a majority of the technologies identified from on-site energy assessments. The technologies include LED lighting, improved building insulation, highly energy-efficient air conditioning equipment, as well as daylighting systems and natural ventilation. Studies are also underway to install renewable energy and make the dealership a net-zero energy (i.e., carbon neutral) building.

Data

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- Ford U.S. Corporate Average Fuel Economy
- Ford U.S. CO_2 Tailpipe Emissions Per Vehicle (Combined Car and Truck Fleet Average CO_2 Emissions)
- Ford Europe CO_2 Tailpipe Emissions Per Vehicle

Tailpipe Emissions

- Ford U.S. Average NOx Emissions
- Ford U.S. Average NMOG Emissions
- Ford U.S. Average Vehicle Emissions

Operational Energy Use and CO_2 Emissions

- Worldwide Facility Energy Consumption
- Worldwide Facility Energy Consumption Per Vehicle
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- North America Volatile Organic Compounds Released by Assembly Facilities
- Ford U.S. TRI Releases
- Ford U.S. TRI Releases Per Vehicle
- Ford Canada NPRI Releases
- Ford Canada NPRI Releases Per Vehicle
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Waste

- Regional Waste to Landfill
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Fuel Economy and CO_2 Emissions

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A. Ford U.S. Corporate Average Fuel Economy
B. Ford U.S. CO_2 Tailpipe Emissions Per Vehicle (Combined Car and Truck Fleet Average CO_2 Emissions)
C. Ford Europe CO_2 Tailpipe Emissions Per Vehicle

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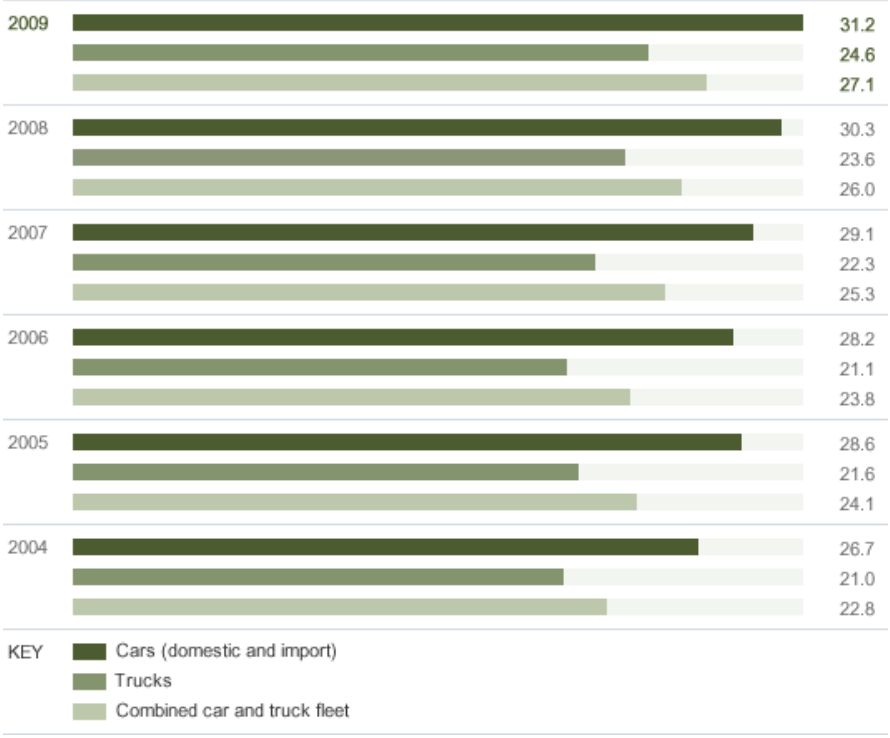
A. Ford U.S. Corporate Average Fuel Economy

Miles per gallon



Miles per gallon

	2004	2005	2006	2007	2008	2009
Cars (domestic and import)	26.7	28.6	28.2	29.1	30.3	31.2
Trucks	21.0	21.6	21.1	22.3	23.6	24.6
Combined car and truck fleet	22.8	24.1	23.8	25.3	26.0	27.1

For the 2009 model year, the Corporate Average Fuel Economy (CAFE) of our cars and trucks increased by 4.2 percent relative to 2008. Preliminary data for the 2010 model year show a 3.2 percent improvement in CAFE for cars and a slight decline of 2.4 percent in CAFE for trucks as compared to 2009. For more

information, please see Fuel Economy and Greenhouse Gas Emissions.

Reported to regulatory authorities

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Fuel Economy and Greenhouse Gas Emissions
Climate Change Progress and Performance: Vehicle

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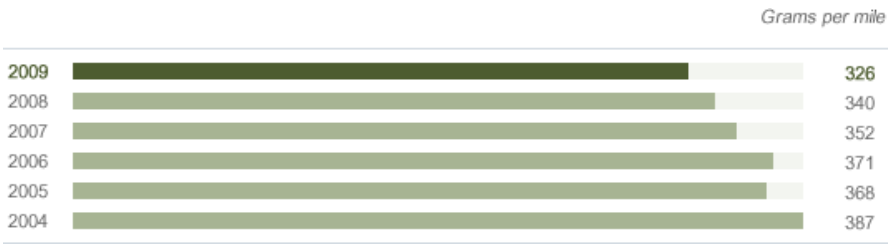
B. Ford U.S. CO_2 Tailpipe Emissions Per Vehicle (Combined Car and Truck Fleet Average CO_2 Emissions)



Grams per mile

2004	2005	2006	2007	2008	2009
387	368	371	352	340	326

Improvement is reflected in decreasing grams per mile.

In 2009, Ford reduced U.S. CO_2 tailpipe emissions per vehicle for the third year in a row. See the Climate Change section for a discussion of our CO_2 emissions performance.

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Fuel Economy and Greenhouse Gas Emissions
Climate Change Progress and Performance: Vehicle

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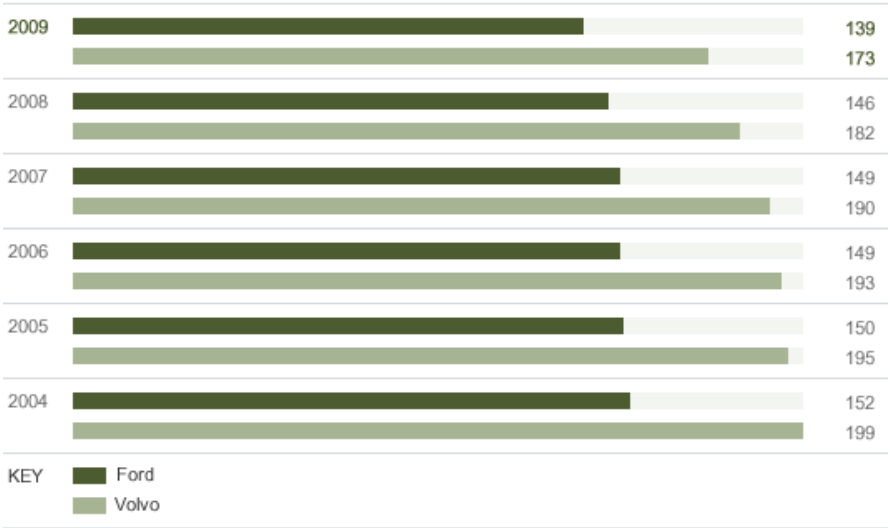
C. Ford Europe CO_2 Tailpipe Emissions Per Vehicle



Grams per kilometer

	2004	2005	2006	2007	2008	2009
Ford	152	150	149	149	146	139
Volvo	199	195	193	190	182	173

Improvement is reflected in decreasing grams per kilometer. European and U.S. fleet CO_2 emissions are not directly comparable because they are calculated in different units and because they are assessed based on different drive cycles. In 2009, we switched from reporting European vehicle CO_2 emissions as a percent of a 1995 base to reporting actual fleet average CO_2 emissions, to parallel our reporting for other regions.

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Tailpipe Emissions

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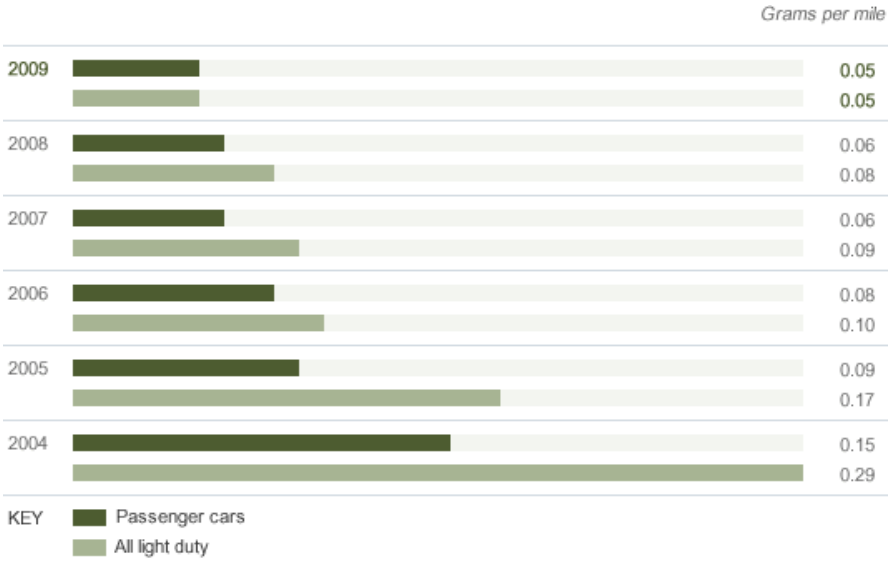
A. Ford U.S. Average NOx Emissions



Grams per mile

	2004	2005	2006	2007	2008	2009
Passenger cars	0.15	0.09	0.08	0.06	0.06	0.05
All light duty	0.29	0.17	0.10	0.09	0.08	0.05

In 2009, Ford reduced average NOx emissions for the seventh year in a row.

Reported to regulatory authorities (EPA)

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Non-CO_2 Tailpipe Emissions

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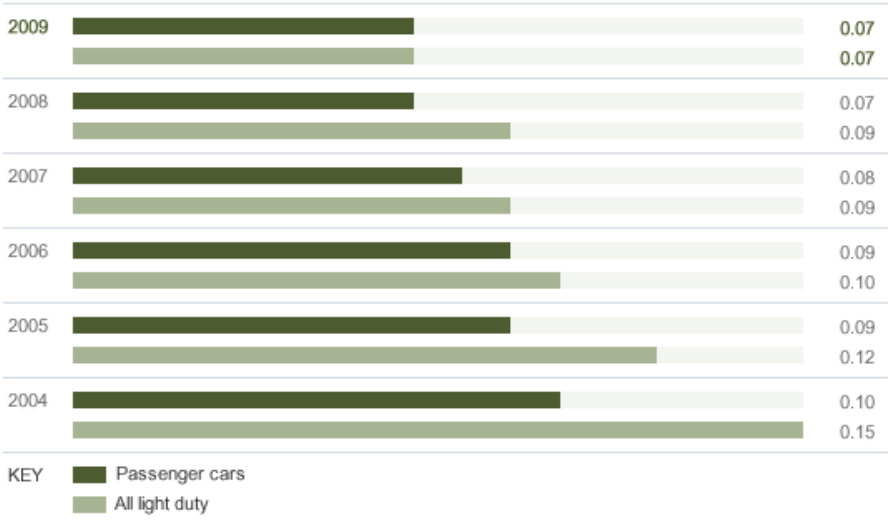
B. Ford U.S. Average NMOG Emissions

Grams per mile



Grams per mile

	2004	2005	2006	2007	2008	2009
Passenger cars	0.10	0.09	0.09	0.08	0.07	0.07
All light duty	0.15	0.12	0.10	0.09	0.09	0.07

NMOG = Non-Methane Organic Gases

In 2009, Ford reduced average NMOG emissions for the seventh year in a row.

Reported to regulatory authorities (EPA)

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Non-CO_2 Tailpipe Emissions

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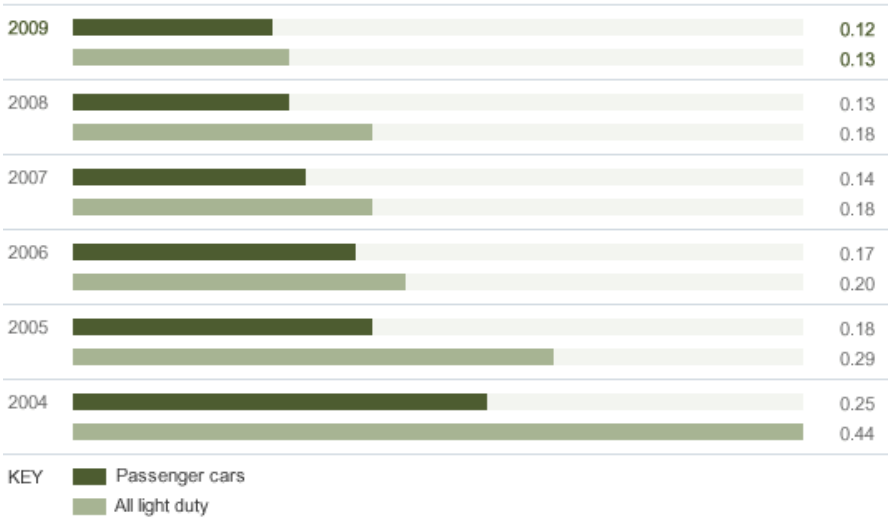
C. Ford U.S. Average Vehicle Emissions

Grams per mile



Grams per mile

	2004	2005	2006	2007	2008	2009
Passenger cars	0.25	0.18	0.17	0.14	0.13	0.12

All light duty	0.44	0.29	0.20	0.18	0.18	0.13

Average vehicle emissions are the smog-forming pollutants from vehicle tailpipes, characterized as the sum of [(NMOG + NOx emissions) x volume] for all products in the fleet.

In 2009, Ford reduced average vehicle emissions for the seventh year in a row.

Reported to regulatory authorities (EPA)

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Operational Energy Use and CO_2 Emissions

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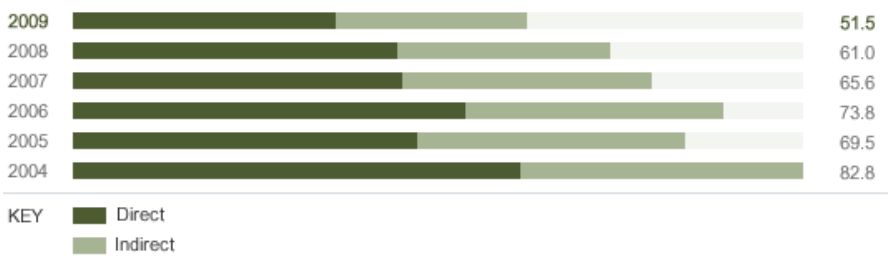
A. Worldwide Facility Energy Consumption

Trillion British Thermal Units



Trillion British Thermal Units

	2004	2005	2006	2007	2008	2009
Direct	50.8	39.0	44.6	37.3	36.7	29.8
Indirect	32.0	30.5	29.2	28.3	24.3	21.7
Total	**82.8**	**69.5**	**73.8**	**65.6**	**61.0**	**51.5**

Data have been adjusted to account for facilities that were closed, sold or new. This data does not include Automotive Components Holdings (ACH) facilities.

We reduced worldwide facility energy consumption for the fourth year in a row. These reductions were accomplished through a wide range of energy-efficiency projects and due to the drop in production. For more information, please see Operational Energy and Greenhouse Gas Emissions.

Data managed through the Global Emissions Manager database

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Operational Energy and Greenhouse Gas Emissions

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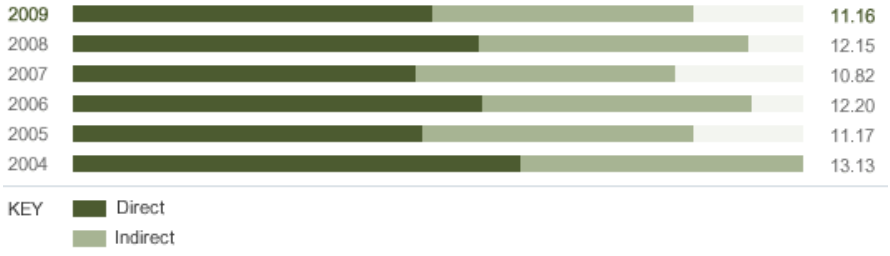
B. Worldwide Facility Energy Consumption Per Vehicle

Million British Thermal Units per vehicle



Million British Thermal Units per vehicle

	2004	2005	2006	2007	2008	2009
BTUs/vehicle direct	8.06	6.27	7.37	6.15	7.31	6.45
BTUs/vehicle indirect	5.07	4.90	4.83	4.67	4.84	4.71
Total	13.13	11.17	12.20	10.82	12.15	11.16

These data do not include Automotive Components Holding facilities.

Energy consumption per vehicle divides energy used by the number of vehicles produced. Averaging energy consumption per vehicles produced yields a somewhat imperfect indicator of production efficiency. When the number of vehicles produced declines, as it has since 2000, per-vehicle energy use tends to rise, because a portion of the resources used by a facility is required for base facility operations, regardless of the number of vehicles produced.

We believe that the long-term trend of declining per-vehicle energy use emissions indicate that more efficient production since 2000 is offsetting the tendency of these indicators to rise during periods of declining production. This interpretation is reinforced by our Energy Efficiency Index, which focuses on production energy efficiency and which has been steadily improving. Our Energy Efficiency Index target also has the effect of driving reductions in CO_2 emissions.

Data managed through the Global Emissions Manager database

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Operational Energy and Greenhouse Gas Emissions

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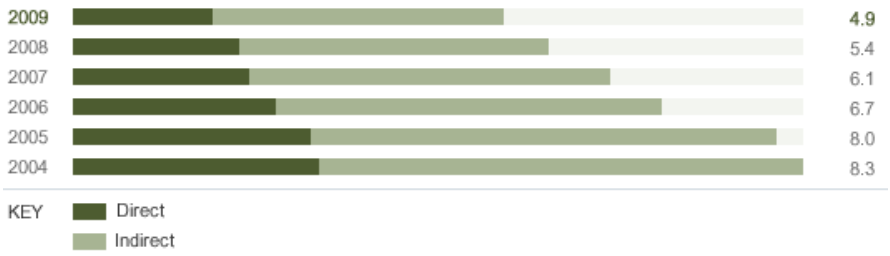
C. Worldwide Facility CO_2 Emissions

Million metric tons



Million metric tons

	2004	2005	2006	2007	2008	2009
Direct	2.8	2.7	2.3	2.0	1.9	1.6
Indirect	5.5	5.3	4.4	4.1	3.5	3.3
Total	8.3	8.0	6.7	6.1	5.4	4.9

The data have been adjusted to account for facilities that were closed, sold or new. The data does not include Automotive Components Holdings facilities.

1. Sixty-one percent of Ford's global facility GHG emissions are third-party verified. All of Ford's North American GHG emissions data since 1998 are externally verified by The Financial Industry Regulatory

Authority, the auditors of the NASDAQ stock exchange, as part of membership in the Chicago Climate Exchange. In addition, all of our European facilities impacted by the mandatory EU Trading Scheme are third-party verified.

We reduced worldwide facility CO_2 emissions for the fifth year in a row. These reductions were accomplished through a wide range of energy efficiency projects. For more information, please see Operational Energy and Greenhouse Gas Emissions.

Third-party verified (North America and EU) [1]

Reported to regulatory authorities (EU). Voluntarily reported to registry or other authority (U.S., Canada, Mexico, Australia, Philippines, Chongqing, China).

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Operational Energy and Greenhouse Gas Emissions

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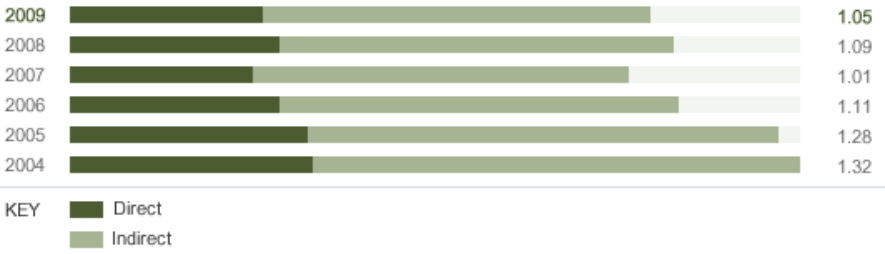
D. Worldwide Facility CO_2 Emissions Per Vehicle

Metric tons per vehicle



Metric tons per vehicle

	2004	2005	2006	2007	2008	2009
Direct	0.44	0.43	0.38	0.33	0.38	0.35
Indirect	0.88	0.85	0.72	0.68	0.71	0.70
Total	**1.32**	**1.28**	**1.11**	**1.01**	**1.09**	**1.05**

These data do not include Automotive Components Holding facilities.

CO_2 emissions per vehicle divides CO_2 emitted by the number of vehicles produced. Averaging CO_2 emissions by the number of vehicles produced yields a somewhat imperfect indicator of production efficiency. When the number of vehicles produced declines, as it has since 2000, per-vehicle energy use tends to rise, because a portion of the resources used by a facility is required for base facility operations, regardless of the number of vehicles produced.

We believe that the long-term trend of declining per-vehicle CO_2 emissions indicate that more efficient production since 2000 is offsetting the tendency of these indicators to rise during periods of declining production. This interpretation is reinforced by our Energy Efficiency Index, which focuses on production energy efficiency and which has been steadily improving. Our Energy Efficiency Index target also has the effect of driving reductions in CO_2 emissions.

Data managed through the Global Emissions Manager database

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Operational Energy and Greenhouse Gas Emissions

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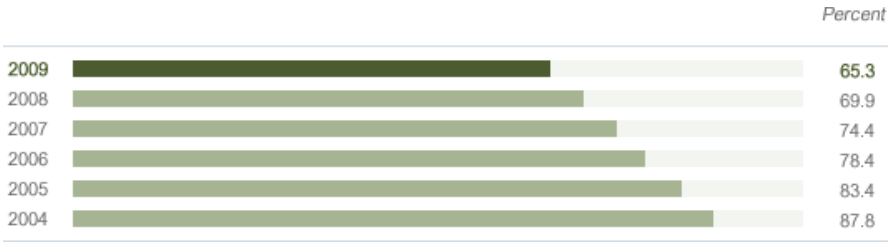
E. Energy Efficiency Index



Percent

2004	2005	2006	2007	2008	2009
87.8	83.4	78.4	74.4	69.9	65.3

The Index, which covers energy use in North America, is "normalized" based on an engineering calculation that adjusts for typical variances in weather and vehicle production. The Index was set at 100 for the year 2000 to simplify tracking against our target of 3 percent improvement in energy efficiency.

We have improved our Energy Efficiency Index score every year since we began calculating this index in 2000. We have achieved these results through a wide variety of energy-efficiency improvements. For more information, please see Operational Energy and Greenhouse Gas Emissions.

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Operational Energy and Greenhouse Gas Emissions

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Water Use

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A. Global Water Use Per Vehicle Produced

Cubic meters per vehicle produced

Cubic meters per vehicle produced

2004	2005	2006	2007	2008	2009
7.94	7.82	7.76	6.21	5.67	5.20

The reduction in water use from 2008 to 2009 reflects a long-term trend of reducing water use per vehicle each year. Ford facilities have achieved reductions in water consumption through a broad range of actions.

Data managed through the Global Emissions Manager database

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Water Use

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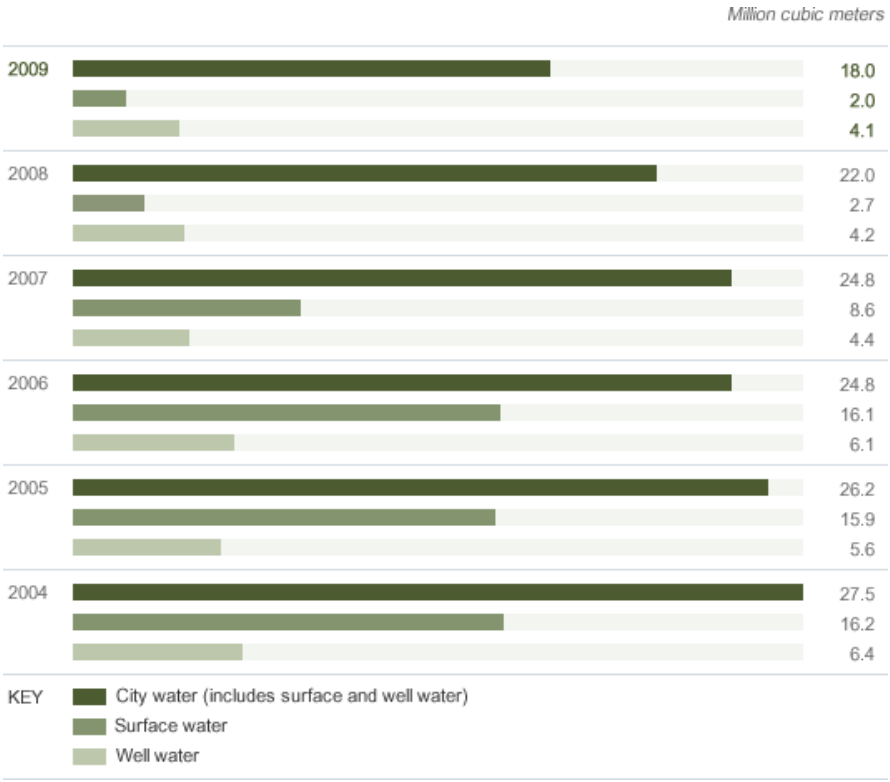
B. Global Water Use By Source



Million cubic meters

	2004	2005	2006	2007	2008	2009
City water (includes surface and well water)	27.5	26.2	24.8	24.8	22.0	18.0
Surface water	16.2	15.9	16.1	8.6	2.7	2.0
Well water	6.4	5.6	6.1	4.4	4.2	4.1

From 2008 to 2009, we reduced our overall water use (from all sources) by 16.6 percent. This reduction exceeds our overall target of a 6 percent reduction in water use each year and reflects a long-term trend of reducing water use from all sources. Ford facilities have achieved reductions in water consumption through a broad range of actions.

Data managed through the Global Emissions Manager database

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Water Use

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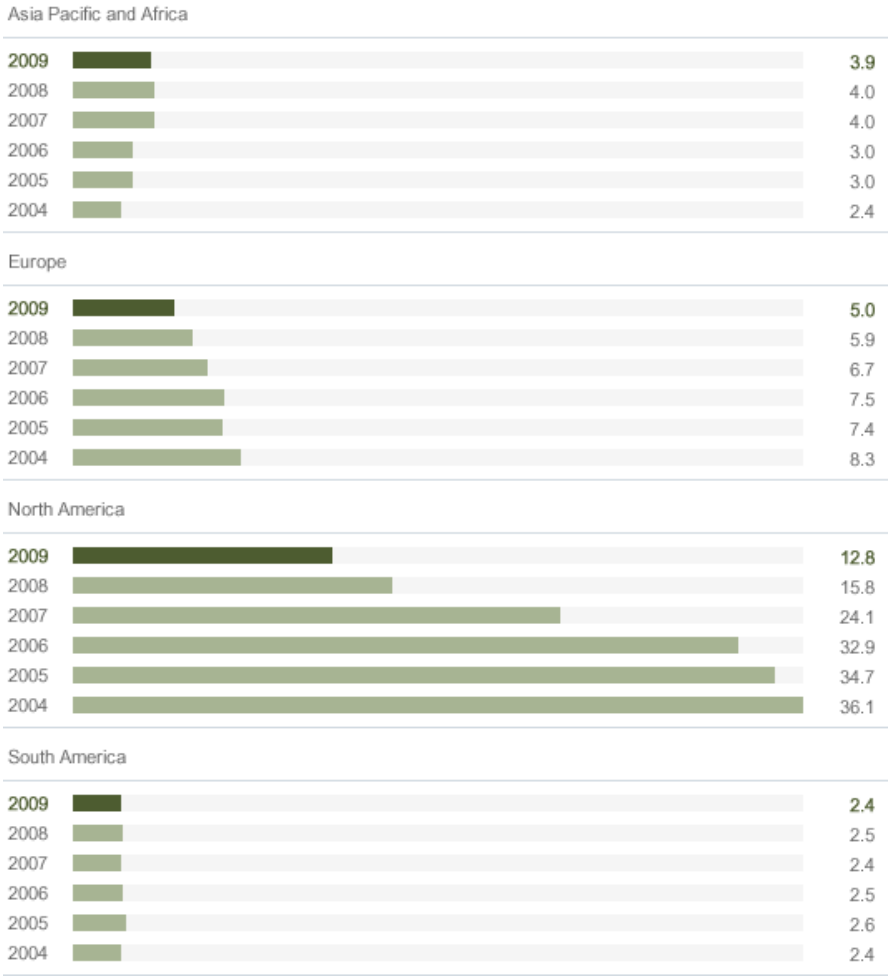
C. Regional Water Use

Premier Automotive Group is now included in Europe

Million cubic meters



Premier Automotive Group is now included in Europe

Million cubic meters

	2004	2005	2006	2007	2008	2009
Asia Pacific and Africa	2.4	3.0	3.0	4.0	4.0	3.9
Europe	8.3	7.4	7.5	6.7	5.9	5.0
North America	36.1	34.7	32.9	24.1	15.8	12.8
South America	2.4	2.6	2.5	2.4	2.5	2.4

2008 Asia Pacific and Africa data changed from our last report due to improved data collection.

This year, we reduced water use in all regions. We have a long-term trend of reducing water use in North America and Europe.

In Asia Pacific and Africa, water use has been increasing over the past few years, due largely to the increase in vehicles produced in this region. From 2008 to 2009, however, we reduced water usage in this region for the first time since 2003.

In South America, water use has remained largely constant since 2003.

Data managed through the Global Emissions Manager database

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Water Use

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Emissions (VOC and Other)

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A. North America Volatile Organic Compounds Released by Assembly Facilities

2010 target = 24

Grams per square meter of surface coated

2010 target = 24

Grams per square meter of surface coated

2004	2005	2006	2007	2008	2009
26	24	24	24	24	21

We reduced VOC emissions in North America by 12.5 percent between 2008 and 2009, exceeding our goal of maintaining emissions at 24 grams per square meter of surface coated. We achieved this goal through, among other things, the use of mold-in-color plastics (which preclude the need for painting) and our fumes-to-fuel technology, which captures VOC emissions from our paint shops and uses them as an energy source.

Data managed through the Global Emissions Manager database

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Facilities-Related Emissions

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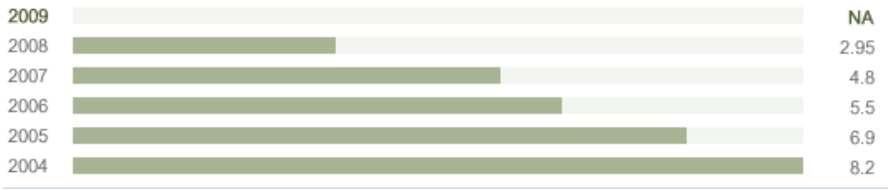
B. Ford U.S. TRI Releases

Million pounds



Million pounds

2004	2005	2006	2007	2008	2009
8.2	6.9	5.5	4.8	2.95	NA

Releases reported under the U.S. Toxics Release Inventory are all in accordance with the law, and many of them are subject to permits. The data shown are the most recent reported to authorities.

Our U.S. Toxic Release Inventory releases decreased significantly from 2007 to 2008, continuing a long-term trend of reducing these releases. These reductions were achieved through material and process changes.

Reported to regulatory authorities (EPA)

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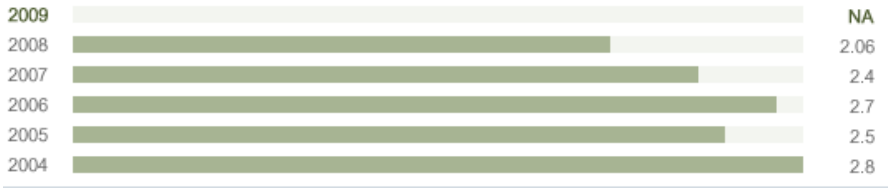
C. Ford U.S. TRI Releases Per Vehicle

Pounds per vehicle



Pounds per vehicle

2004	2005	2006	2007	2008	2009
2.8	2.5	2.7	2.4	2.06	NA

Releases reported under the U.S. Toxics Release Inventory are all in accordance with the law, and many of them are subject to permits. The data shown are the most recent reported to authorities.

Our U.S. Toxic Release Inventory releases per vehicle decreased from 2007 to 2008, the third year in a row we have reduced these emissions. These reductions were achieved through material and process changes.

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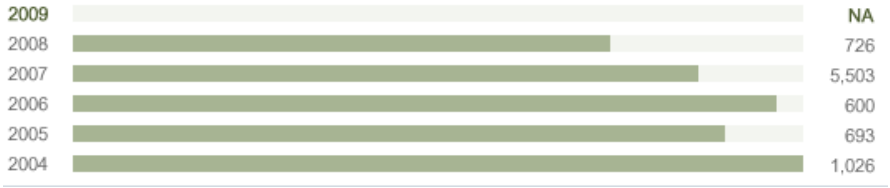
D. Ford Canada NPRI Releases

Metric tonnes



Metric tonnes

2004	2005	2006	2007	2008	2009
1,026	693	600	5,503	726	NA

Releases reported under the Canadian National Pollutant Release Inventory are all in accordance with the law, and many of them are subject to permits. The data shown are the most recent reported to authorities.

Our Canada National Pollutant Release Inventory releases decreased substantially from 2007 to 2008. With this decrease, we return to a multi-year trend of reducing NPRI releases each year. These reductions were achieved through material and process changes.

Reported to regulatory authorities (Environment Canada)

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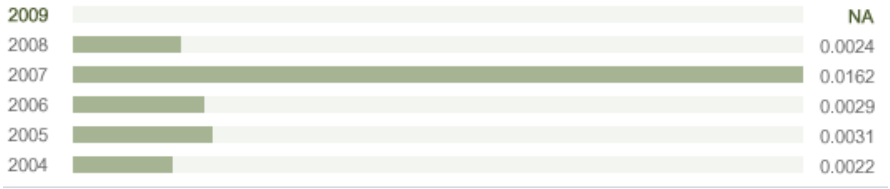
E. Ford Canada NPRI Releases Per Vehicle

Metric tonnes per vehicle



Metric tonnes per vehicle

2004	2005	2006	2007	2008	2009
0.0022	0.0031	0.0029	0.0162	0.0024	NA

Releases reported under the Canadian National Pollutant Release Inventory are all in accordance with the law, and many of them are subject to permits. The data shown are the most recent reported to authorities.

Our Canada National Pollutant Release Inventory releases per vehicle decreased substantially from 2007 to 2008. These reductions were achieved through material and process changes.

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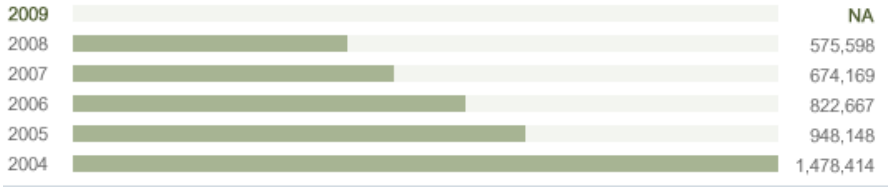
F. Australia National Pollutant Inventory Releases (Total Air Emissions)

Kilogams per year



Kilograms per year

2004	2005	2006	2007	2008	2009
1,478,414	948,148	822,667	674,169	575,598	NA

Releases reported under the Australian National Pollutant Inventory are all in accordance with the law, and many of them are subject to permits. The data shown are the most recent reported to authorities.

Our ANPI releases decreased by 14 percent from 2007 to 2008, the fourth year in a row we have reduced these releases. These reductions were achieved through material and process changes.

Reported to regulatory authorities (NPI)

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Waste

DATA ON THIS PAGE

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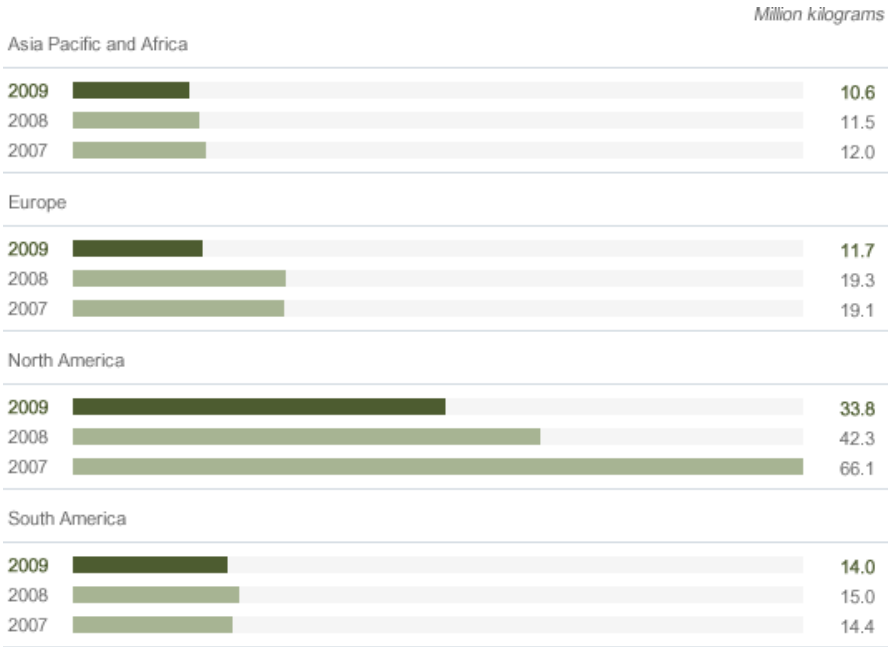
A. Regional Waste to Landfill



Million kilograms

	2007	2008	2009
Asia Pacific and Africa	13.5	11.5	10.6
Europe	19.1	19.3	11.7
North America	66.1	42.3	33.8
South America	14.4	15.0	14.0

The data for 2007 and 2008 have been corrected. Also, AutoAlliance International, our joint-venture plant in Flat Rock, Michigan that produces the Ford Mustang, is included for 2009.

In 2009, we reduced total waste to landfill by 20.5 percent compared to 2008. We reduced waste to landfill in all regions except for Asia Pacific and Africa. The slight increase in that region is due mainly to an increase in production. In North America, we reduced waste to landfill by 40 percent.

We decreased waste to landfill primarily through aggressive efforts to generate less waste and recycle more, and through the use of waste-to-energy incineration facilities.

Data managed through the Global Emissions Manager database

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B. Waste to Landfill Per Vehicle

Kilograms

Kilograms

2007	2008	2009
18.87	17.76	15.20

The data for 2007 and 2008 have been corrected this year. Also, AutoAlliance International, our joint-venture plant in Flat Rock, Michigan that produces the Ford Mustang, is included for 2009.

Total waste to landfill per vehicle continued to decline in 2009. This shows we are reducing total waste regardless of production levels, and therefore using resources more efficiently.

We decreased waste to landfill primarily through aggressive efforts to generate less waste and recycle more, and through the use of waste-to-energy incineration facilities.

Data managed through the Global Emissions Manager database

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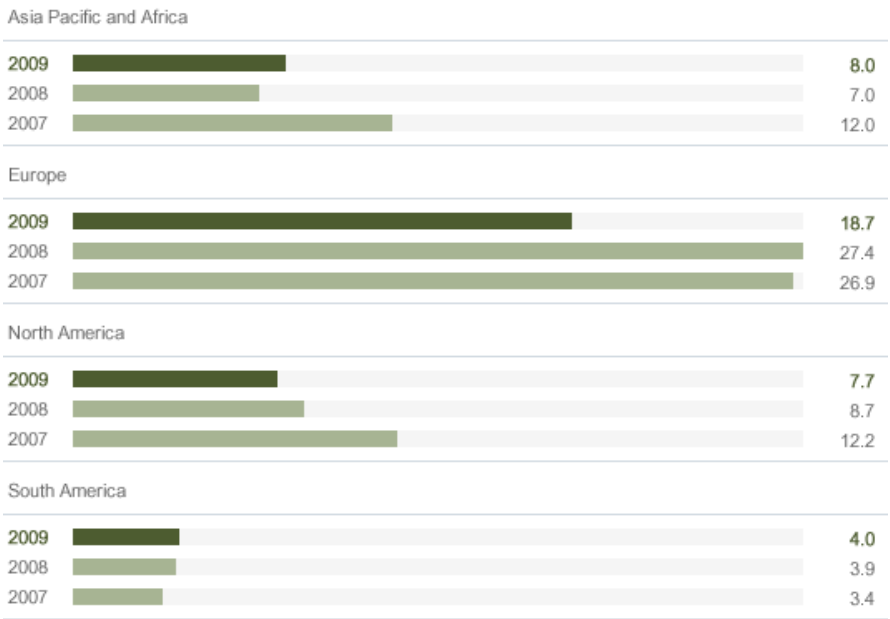
C. Regional Hazardous Waste Generation

Million kilograms



Million kilograms

	2007	2008	2009
Asia Pacific and Africa	12.0	7.0	8.0
Europe	26.9	27.4	18.7
North America	12.2	8.7	7.7
South America	3.4	3.9	4.0

We reduced the generation of hazardous waste in all regions from 2008 to 2009. In North America and Asia Pacific, this is the third year in a row we have reduced hazardous waste. These reductions are due to material and process changes.

Data managed through the Global Emissions Manager database

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D. Hazardous Waste Generation Per Vehicle

Kilograms

Kilograms

2007	2008	2009
9.1	10.0	8.3

We reduced hazardous waste generation per vehicle from 2008 to 2009. This shows we are reducing hazardous waste regardless of production levels, and therefore using resources more efficiently.

Data managed through the Global Emissions Manager database

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Case Studies

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Ford's Best in Powertrain Environmental Initiative Produces Impressive Results

Beginning in 2009, Ford's Powertrain Operations management challenged our North American and European powertrain plants to reach a new level of best-in-class performance on four key environmental performance metrics that support Company objectives: electrical energy, hydrocarbon, water use and waste-to-landfill reductions. This program, called "Best in Powertrain," is intended to improve environmental performance by spurring learning and the sharing of best practices across all of the powertrain plants.

Read more

Ford Drives Green with Sustainable Printing

In 2009, a small but determined group from various departments within Ford joined together to develop a sustainable paper strategy for the Company. The strategy stated that all high-volume, consumer and employee printing projects should be produced using paper that contains at least 10 percent post-consumer recycled fiber and that is certified by the Forest Stewardship Council. Increasing the use of recycled paper may sound like a small step for an automotive company. However, the results have been anything but small.

Read more

Award-Winning New Machining Process Saves Money, Time, and Resources

In 2009, Ford introduced a new machining process that uses inputs more efficiently and significantly reduces waste production, energy use and costs. Ford's new process uses compatible coolant, oils and lubricants that enable the recycling and reuse of fluids, thereby significantly reducing the production of oily waste.

Read more

TOOLBOX

Print report

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Ford's Best in Powertrain Environmental Initiative Produces Impressive Results

Beginning in 2009, Ford's Powertrain Operations management challenged our North American and European powertrain plants to reach a new level of best-in-class performance on four key environmental performance metrics that support Company objectives: reductions in electrical energy use, hydrocarbon use, water use and waste to landfill. This program, called "Best in Powertrain" (BiP), is intended to improve environmental performance by spurring the learning and sharing of best practices across all Ford powertrain plants. A cornerstone of this program was the development of environmental performance goals for each of the four performance areas. The plants with the best performance on each of these metrics provide the goal that other plants are asked to achieve. Each plant is then asked to adopt annual "stretch" goals for reducing their environmental footprint in each of the four key measurement areas, based on a five-year glide-path that will enable them to reach the "Best in Powertrain" levels.

In each plant, the BiP program is spearheaded by environmental leadership teams for each of the four key performance areas. These teams are tasked with developing creative action plans to meet the BiP stretch goals for their plant over five years, in order to lessen the plant's environmental footprint. In addition, they were asked to both share best practice ideas and lessons learned with their counterparts at the other powertrain plants, and to adopt best practices developed at other powertrain plants.

"You get a much higher degree of ownership with this approach," said Kevin Poet, a launch manager at the Van Dyke Transmission Plant in southeastern Michigan. "And the process provided information resources and ideas to go along with the objectives, instead of just handing down targets."

The process of sharing information and performance accomplishments among plants is a key to the Best in Powertrain approach. For example, Poet noted that this process made information on how to improve environmental performance more easily accessible across plants. "By formalizing environmental performance reviews and reports, the BiP process ensured that the information was being used as intended, and it accelerated learning across locations. We had cross-plant discussion almost every week. At Van Dyke, we were able to take advantage of actions at other locations to improve our performance, and we learned how to avoid future issues that could affect our performance. A little friendly competition is not a bad thing, either," Kevin joked. "We cascaded what we learned about other plants' performance to our teams on the floor that are responsible for delivering to these objectives, and it gave them an incentive to go the extra mile."

Gary Johnson, Executive Director for Manufacturing in our Asia Pacific and Africa region (and formerly Director of Manufacturing for North America Engine) also pointed to information sharing and friendly competition when describing the success of the BiP program. "The BiP program kicked off as an opportunity for us to compare our plants globally in key categories," Gary said. "When we first put the metrics together, we uncovered differences of up to millions of dollars in usages from the best plant to the plant with the most opportunity for improvement. We kicked off with a meeting of all North American powertrain plants to show them the metrics and the differences, and to set up action plans to see what we could do to close the performance gaps. It wasn't easy at first, but once we had the data in front of everyone, and were able to show how different plants were meeting their targets, the rest of the plant teams started to follow. This approach has really created a lot of ownership and motivation at the individual plant level."

So far, the BiP program has had impressive results. Ford's powertrain plants have risen to the challenge and delivered significant improvements in all the environmental performance areas. As hoped, employees have also shared insights and ideas within plants and from plant to plant to spur increased innovation and performance improvements.

At the Windsor Engine Plant, in Windsor, Ontario, for example, the environmental team earnestly embraced the program and implemented actions throughout 2009 that significantly reduced their

environmental footprint. Among their accomplishments, they:

- Improved energy efficiency by 42 percent compared to 2006 (on a per-unit basis).
- Reduced water usage by 17 percent compared to 2008 (on a total-volume basis).
- Reduced hydrocarbon usage by 20 percent compared to 2008 (on a per-unit basis).
- Decreased waste to landfill by 90 percent compared to 2008 (on a total-volume basis). As a result of the waste-diversion efforts, the Windsor Engine Plant is Ford's first North American plant to achieve zero waste to landfill.

Karen LeBlanc, Environmental Management Representative at the Windsor Engine Plant, indicated that every department in the plant made significant efforts to help achieve the goals. For example, by increasing the performance efficiency of their cooling towers, they saved about 14 million liters of water in 2009. Teams made the environmental goals a priority, meeting twice a week to communicate, brainstorm and coordinate efforts for maximum effectiveness.

The Van Dyke Transmission Plant also exemplifies the success of the Best in Powertrain program. Prior efforts by the plant's employees had already achieved low levels of water use, hydrocarbon/oil use, electrical energy use and waste to landfill. However, they managed to improve their performance even more and to significantly exceed their BiP goals in all of the four key performance areas.

As a result of all the North American powertrain plants' actions, North American Powertrain Operations (NA PTO) exceeded Company targets in all four key performance areas. Specifically, the NA PTO reduced water use by 25 percent in 2009 on a total volume basis, compared to a targeted 6 percent reduction. They reduced waste to landfill by 60 percent on a total volume basis, compared to a targeted reduction of 10 percent. And they reduced hydrocarbon usage by more than 14 percent in 2009 vs. 2008. These results were largely due to the extensive actions taken by the Livonia Transmission Plant, Windsor Engine Plant and Sterling Axle Plant in increasing accountability for hydrocarbon usage and fixing water leaks.

In 2010, we are expanding the Best in Powertrain environmental initiative to include our Asia Pacific and South American powertrain plants, as well as formalizing the program in Europe, which will expand our learning community – and our environmental improvements – even further.

TOOLBOX

Print report

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Ford Drives Green with Sustainable Printing

In 2009, a small but determined group from various departments within Ford joined together to develop a sustainable paper strategy for the company. The strategy stated that all high-volume, consumer and employee printing projects should be produced using paper that contains at least 10 percent post-consumer recycled fiber and that is certified by the Forest Stewardship Council (FSC). Increasing the use of recycled paper may sound like a small step for an automotive company. However, the results have been anything but small.

Due to this strategy, Ford has used more than 12.6 million pounds of recycled-content paper rather than virgin paper over the past year, which translates into some pretty significant environmental benefits, including:

- 12,000 trees preserved
- 35,000 lbs. of water-borne waste not created
- 5.2 million gallons waste-water flow avoided
- 570,000 lbs. of solid waste not generated
- 1.1 million lbs. net greenhouse gases prevented
- 8.6 billion BTUs of energy not consumed

Using FSC-certified paper has been an important part of the initiative. FSC certification provides a highly recognized and respected third-party chain of custody review to confirm that the paper has been procured through sustainable practices. The certification requires that wood products have been sustainably handled from the forest where they are harvested, through the pulp purchased by the paper mill to the printer who manufactured the end project. It also supports a range of sustainable benefits. Using FSC-certified productshelps to ensure that paper pulp is not harvested from endangered rainforest timber. In addition, most FSC paper is produced domestically, so it supports U.S. jobs.

Ford's strategy requests that printed pieces be labeled as recycled, with the amount of post-consumer waste content noted, along with the "FSC certified" logo and text stating that it was printed in the United States. This is not just a way to acknowledge Ford's use of sustainable paper – it is a key part of the education process. It helps to fulfil one of the goals of the project, which was to reinforce employee and consumer awareness of Ford's efforts to promote sustainable printing.

Implementing this new paper strategy has taken some concerted effort. Driving that effort has been a small group led by Nicole DesNoyer, a producer in Ford's Corporate Communications department, and including key suppliers and members from the Communications, Purchasing and Sustainability departments.

First, Nicole's team identified key projects that would be good candidates for conversion post-consumer recycled and FSC-certified paper. Then they met with the relevant Ford project leaders and discussed with them the environmental and social benefits of the print strategy. "One of the key things I do is to open an informative discussion with the project owner about why this important to Ford, how easy it is to do and how significant the benefits of changing to recycled paper can be," Nicole explained.

To serve as a model of what could be done, Nicole migrated all of the publications she managed – including Ford's Sustainability Report, the corporate financial Annual Report and the employee and retiree magazine @Ford – to paper with at least 10 percent post-consumer recycled content and FSC certification. This was used as an example to other project managers that it was possible to use recycled content paper without any loss in print performance, appearance or product quality. In most cases, it was cost-neutral to existing budgets.

With these successes under her belt, the team also worked with Ford's Purchasing department and Xpedx, Ford's primary corporate coated paper supplier, to build additional awareness among

Ford employees, marketing groups, creative agencies and suppliers about sustainable paper options. Working with Xpedx, Ford offered project managers a pre-established, limited range of paper options that contained 10 percent post-consumer recycled content and were FSC-certified. By limiting the number of paper choices and suppliers, Xpedx could buy and negotiate in large volumes with the major U.S. and international paper mills, allowing Ford to get the best pricing while still providing the user a variety of paper options with the desired sustainable characteristics.

Still, one of most common concerns about using the certified recycled paper was that it would cost more. However, by investigating current project specifications and working with the corporate paper merchants, the team was able to find acceptable sustainable papers that were cost-neutral or of minimal cost impact to projects.

Throughout the implementation process, the team aimed to increase upper management and project managers' awareness of the value of recycled and certified sustainable paper to Ford's corporate image, reputation for social responsibility and implementation of the "Drive Green" pillar of Ford's corporate mission. The team took their facts about resources saved and potential gains from using sustainable paper, as well as the menu of recycled paper options, to the managers. Ultimately, they received management support from a variety of Ford departments, including Corporate Communications, Marketing and Sales, Investor Relations, the Office of General Council, Ford Motor Credit Company, Sustainability, Environment & Safety Engineering, and Ford Customer Service. Some managers were skeptical at first, but in the end, all agreed to make the switch to certified post-consumer recycled paper.

As a result, Ford is now sustainably printing a number of high-volume projects, including internal and owner magazines; financial documents including 10Ks, proxy statements and annual reports; consumer vehicle catalogs; consumer direct mail and brochures; vehicle owners' manuals and glovebox packages; and service technician training manuals.

"I am continually motivated by how many people within Ford, the advertising agencies, creative partners and our suppliers are really excited and supportive of this effort," said Nicole. "Once we tell people about what we've accomplished, the support we have continued to achieve, and the fact that the paper performance and cost are comparable to virgin paper, most people are excited to get on board."

Nicole and the team admit that paper is a just small part of Ford's sustainability efforts, considering recent advances in vehicle fuel economy and electrification. However, switching to recycled paper was a lot easier to do than many had expected. "Compared to some of the technology and engineering this company has accomplished, this task is so easy," Nicole notes. And it may prove to make a difference with customers. "My goal is that if our sustainable efforts in print persuade a consumer to buy a Ford product over another brand because they notice we are serious about our social responsibilities, then our efforts are making the difference for the Company," Nicole said. "Plus, being environmentally responsible is just the right thing to do."

Looking to the future, the team is continuing to promote the use of post-consumer recycled paper. They are also working to expand the recycled paper strategy globally. "This is a really exciting time for Ford," Nicole explains. "We are in a positive state of change, and we are having some great successes and consistent forward momentum. This is a great time for people within Ford to be embracing these changes, and we hope we can continue to expand our progression to sustainable paper use throughout the Company."

TOOLBOX

Print report

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Award-Winning New Machining Process Saves Money, Time, and Resources

In 2009, Ford introduced a new machining process that uses inputs more efficiently and significantly reduces waste production, energy use and costs. Machining parts requires coolants, lubricants, hydraulic fluids and other hydrocarbon-based process fluids. In traditional machining, these fluids are incompatible, which means that once they are mixed together during the machining process, they are ruined for further use. The resulting waste liquid must be removed from the system regularly and disposed of as oily waste.

Ford's new process uses compatible coolant, oils and lubricants that enable the recycling and reuse of fluids, thereby significantly reducing the production of oily waste. Unlike previous machining systems, the "compatible fluids" process uses an ultra-filtration system that keeps the wash fluids clean, recycles all oil contaminants and reblends the coolant so that it can be reused. The process also reduces energy usage, because it allows the use of smaller coolant systems and reduces chiller and extraction requirements. In addition to these environmental benefits, the process improves operating conditions for plant employees, improves surface finish and tool life, and reduces machine downtime by reducing the need to clean or replace central wash filters from every six weeks to every two years. All of these benefits translate into both better performance and lower costs.

The compatible fluids system was piloted at Ford's Dagenham Engine Plant in Germany in the production of 1.4 and 1.6 liter engines. The benefits at this plant have been impressive. Compatible fluids machining reduced oily waste sent to landfill by 80 percent per year, resulting in savings of approximately $400,000 per year. It also reduced the cost of hydrocarbon-based inputs per engine by 40 percent to 50 percent, making Dagenham's hydrocarbon costs the lowest in all of Ford's engine operations.

Based on these impressive results, the compatible fluids machining process received the 2009 Henry Ford Technology award, an award given by Ford Motor Company to researchers, engineers and scientists for their work on innovative automotive technologies. It also won the UK's Business in the Community Eco-efficiency Award.

We are rapidly expanding the use of compatible fluids machining. So far, it has been implemented in the Chihuahua and Bridgend engine plants and is currently being installed in seven other facilities around the world. We plan to continue to expand this process to our other global facilities. Once this process is implemented globally in all of our engine, powertrain and chassis plants, the savings will be considerable. We predict that we will save up to $35 million per year globally due to reduced hydrocarbon usage, waste avoidance, reduced downtime, and improved tool life. Compatible fluids machining will help us continue to reduce our environmental footprint by reducing our use of hydrocarbons and energy and decreasing waste production.