

# Ford Report on the BUSINESS IMPACT OF CLIMATE CHANGE

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In November 2004, Ford Motor Company received a shareholder resolution from the Interfaith Center on Corporate Responsibility (ICCR) and the Coalition for Environmentally Responsible Economies (Ceres) and others requesting we release information specific to our greenhouse gas emissions strategy. Much of the information requested is reported annually in our Sustainability Report (formerly called the Corporate Citizenship Report), and we have excerpted the most recent Sustainability Report as an appendix to this report. However, we agreed to publish the industry's first report dedicated to the issue of climate change and its effect on our business as well as the automotive industry as a whole. While we have worked closely with ICCR, Ceres and other stakeholders throughout the writing of this report, the material contained here is is our view of this important global issue.

This report has been reviewed and approved by senior management, the Office of the Chairman and Chief Executive (OCCE) as well as the Environmental and Public Policy Committee of the Board of Directors.

What you will read in the following pages is a snapshot of work in progress. We will continue to work on technology, policy, marketing and product initiatives that we expect will move the issue – and our business – forward over the near to medium term. We hope that this report will encourage other companies and other industries to join us in an effort to develop an industry wide, long-term strategy for reducing greenhouse gas emissions (GHG) – a strategy that is truly global in its reach, involving all automakers, fuel providers, consumers and policy makers.

# Introduction

Global climate change caused by human combustion of fossil fuels and the resulting emission of greenhouse gases (GHGs) is – along with energy security – widely viewed as a critical global issue with a range of potential effects on human health, community infrastructure, ecosystems, agriculture and economic activity.

This report describes how Ford Motor Company views the business challenge associated with climate change; how concerns about GHGs are linked to other factors affecting our business; the steps we are taking to manage the risks and capture opportunities associated with the issue; and the market, policy, social and technological enablers required to achieve significant changes in our industry's carbon footprint.

We offer this report to help investors, policy-makers and consumers better understand the business implications of climate change for automotive companies. It is in the interest of society and business to reduce the uncertainty and increase the predictability of policy frameworks and market conditions around the issue of climate change. Therefore we intend to participate fully in the larger public dialogue on actions required by governments, businesses and individuals to address climate change concerns.

# IMPLICATIONS

At Ford, the issue is not abstract. We are the third largest automobile manufacturer in the world. We manufacture and distribute automobiles in 200 markets across six continents. We employ about 325,000 people worldwide and produce passenger cars, trucks, engines, transmissions, castings and forgings and metal stampings of all kinds at 111 wholly owned, equity-owned and joint venture plants around the world. The energy we use to produce our vehicles and power Ford facilities resulted in 8.4 million metric tonnes of CO<sub>2</sub> emissions (CO<sub>2</sub> is the most significant of the greenhouse gases) in 2004. About 12 percent of all man-made GHG emissions worldwide come from burning fossil fuels in the cars and trucks of all makes on the road today.

Concerns about climate change – along with growing constraints on the use and availability of carbon-based fuels – affect our operations, our customers, our investors and our communities. The issue warrants precautionary, prudent and early actions to enhance our competitiveness and protect our profitability in an increasingly carbon-constrained economy.

The relevant long-term challenge facing society today and in the future is to stabilize the concentration of GHGs in the atmosphere at a level that prevents dangerous human-induced interference with the climate system. In the words of the G8 leaders at Gleneagles earlier this year, "While uncertainties remain in our understanding of climate science, we know enough to act now to put ourselves on a path to slow and, as the science justifies, stop and then reverse the growth of greenhouse gases."

# ACTIONS

To that end, since 2000 we have cut the emissions of  $CO_2$  from our plants and facilities by 15 percent, and we have targeted even further reductions. We participate in  $CO_2$  trading mechanisms in Europe and North America; we have increased the percentage of energy we obtain from renewable sources; we have announced the first large-scale "Fumes to Fuel" fuel cell project that will convert captured VOCs from paint shop emissions into electricity to power operations and reduce overall emissions; and we have announced plans to offset the  $CO_2$  emitted in the production of our Ford and Mercury hybrid vehicles.

But while we are proud of our accomplishment in reducing  $CO_2$  from our operations and have benefited from the energy cost savings that go with it, we recognize that only about 10 percent of the lifetime GHG emissions from a vehicle occur during its production. The remaining 90 percent attributed to each vehicle is emitted when the customer is using it – when it burns gasoline or diesel fuel from fossil sources.

We are taking a wide range of actions that help reduce the in-use GHG emissions of our vehicle fleet -- from expanding our hybrid lineup, to encouraging more use of ethanol fuel, to shifting our mix of products to more fuel efficient cars, to improving the efficiency of conventional gasoline and diesel engines, to raising the awareness of consumers.

We know that many of our stakeholders expect this report to spell out specific targets and milestones for improvements in the fleet fuel efficiency of our products. It will not do that. In our highly competitive industry, there continue to be too wide a range of possible futures for technologies, markets, and regulatory frameworks for our company to set unilateral targets on the in-use performance of our products. Nevertheless, Ford Motor Company is committed to doing its part to stabilize atmospheric GHGs, and we will describe in the following pages the range of actions we are pursuing.

# CHALLENGES

Of course, no single company, industry, or even nation can address this issue alone. Our industry is part of a complex, energy-intensive global system. This system is growing even larger and more complex as new markets like China and India come on line with dramatic increases in energy demands overall -- as well as significant growth in the number of vehicles on the road and miles traveled. Stabilization will therefore require strategies that make financial sense, engage consumers, encourage technological innovation and provide stable, market-based mechanisms across the entire economy.

Within the road transport sector, we see the opportunities to reduce in-use GHG emissions defined by three inter-related factors:

- The embedded carbon content of the fuel available to consumers.
- The carbon efficiency of vehicles.
- The purchase decisions and driving behavior of customers, including vehicle miles traveled

This "fuel + vehicle + driver" formula underpins our engagement with both fuel companies and consumers in addressing the GHG challenge.

# **CONVERGENT ISSUES**

Importantly, the issue of climate change is closely related to the equally pressing issues of energy security (which tends to be reflected primarily in regulations) and fuel prices (which drive market behavior). GHG emissions are a common currency for all of these issues. But we recognize that customer and policy priorities differ around the world, and our approaches vary accordingly; for example, our voluntary agreement as part of ACEA in Europe has been focused directly on CO<sub>2</sub> reduction. Our aggressive investment in hybrid production in the U.S. has been driven in part by consumer demand for more fuel efficient vehicle choices and innovative technologies. And our support for an expanded bio-ethanol infrastructure in the U.S. is underpinned by the call for less dependence on imported oil. Each of these initiatives results in lower CO<sub>2</sub> emissions, but emerges from different market and policy priorities.

In this climate change report we will focus on GHG emissions and stabilization of atmospheric CO<sub>2</sub>. However, it's important to note that our climate change strategy fits within a much more comprehensive approach to sustainability that includes overall environmental management, safety, and our leadership in human rights. For further information on our broader sustainability framework, we invite you to refer to our recently released Sustainability Report, available at www.ford.com/go/sustainability.

# COMMITMENTS

Against this background, we are committed to playing a leadership role in the reduction and stabilization of GHG emissions. Specifically:

- We are continuously reducing the GHG emissions and energy usage of our operations.
- We are developing the flexibility and capability to market lower-GHG-emissions products that will attract consumers.

• We are working with industry partners, oil companies and policy makers to establish an effective and more certain market, policy and technological framework for reducing road transport GHG emissions.

# Background

# THE CLIMATE ISSUE

The evidence for environmental and social impacts of climate change is discussed in detail and greater authority in numerous sources and will not be addressed here. However, we recognize that some key conclusions have earned widespread support by scientists, policy makers and business leaders and therefore define the assumptions underpinning our approach to climate change. We find these conclusions compelling enough to serve as a framework for our analysis and planning.

For example, the growing weight of evidence holds that man-made greenhouse gas emissions are starting to influence significantly the world's climate in ways that affect all parts of the globe.

And many scientists, businesses and governmental agencies have concluded that stabilizing the atmospheric CO<sub>2</sub> concentration at around 550 parts per million (ppm) (compared with the current 380 ppm and the pre-industrial level of approximately 270 ppm), may help forestall or substantially delay the most disruptive aspects of global climate change.

# **BUSINESS DRIVERS**

The related issues of climate change and energy security have become a market force that is changing the operating environment in the automobile industry and putting business value at stake. That value can be measured in at least four dimensions.

### Market share

We develop, produce and market vehicles for retail customers. Our viability as a business depends above all on offering products and services that customers will buy.

Over the past decade, the U.S. market shows that few customers choose cars based on specific concerns about climate change and GHG emissions. Even fewer are willing to pay the incremental cost of "green" automotive technologies or accept trade offs of other attributes (safety, performance, features, styling). Our experience with retail marketing campaigns based on environmental attributes tend to have very little effect on sales.

However recent research indicates that this might be changing. According to research conducted for Ford in the U.S. by DYG, Inc., fuel economy is now equal with safety and more important than price in vehicle purchase decisions; up four points from the previous report. This suggests that consumer concerns about the environmental impact of cars are increasing at a dramatically higher rate than concerns about vehicle safety, reliability or affordability.

Importance of Au	tomotive Priorities	(Top three Box)
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	2005 Rating %	Pt. Change 2004	Pt. Change 2003
Improved mpg	86	+4	+4
Increased reliability &			
Dependability	85	-2	-4
Improved safety	82	-3	-4
Alternative fuel vehicles	82	+4	+7
Hybrid vehicles	80	0	+3
More affordable	73	+2	-2

We have seen sales of truck-based SUVs across the industry decline during 2005, while sales of lighter weight cars and car-based utility vehicles have increased. There are many reasons for this, but we assume that at least part of this shift is based on growing consumer interest in cars and trucks that deliver higher fuel economy figures.

The picture looks somewhat different in markets outside the U.S. In Europe and Japan, for example,  $CO_2$ , the primary greenhouse gas, is already part of the consumer's lexicon. High fuel taxes,  $CO_2$  linked vehicle taxation,  $CO_2$  linked personal taxation, specific  $CO_2$  vehicle labeling and more widespread environmental awareness have already begun to shape consumer preferences towards more  $CO_2$  friendly vehicles.

#### **Regulatory compliance**

We are a closely regulated industry. Fuel economy standards have long been a staple of regulation in the auto industry, especially in the U.S. But climate change and GHG concerns are already beginning to drive the regulatory agenda in many countries and even some U.S. states

In some cases voluntary agreements are taking the place of regulation. In Europe, for example, the European Automobile Manufacturers Association (ACEA) set a goal of achieving average  $CO_2$  emission reductions of 25 percent by 2008 compared with 1995. And in Canada the auto industry agreed with the Canadian government to reduce GHG emissions from Canada's fleet of cars and trucks by 5.3 megatonnes by 2010.

Whether legislated, voluntary or market driven we continue to anticipate the need for additional GHG emissions reductions and to pursue innovative ways to cost-effectively introduce required product and advanced technology solutions.

# **Shareholder Value**

We see early signs that investors and analysts are paying increasing attention to the impact of climate change on the companies and industries they cover. For example, in May 2005, a group of 28 institutional investors with assets in excess of US\$3 trillion released an action plan that calls on companies, regulators and the investment industry to provide greater disclosure and comprehensive analysis on the investment risks associated with climate change. Since then, we have seen investment research reports by Merrill Lynch and JP Morgan Chase that explore these investment risks in the automobile industry. And Goldman Sachs recently declared that "diverse, healthy natural resources... are a critical component of social and sustainable economic development" and committed to "help find effective market-based solutions to address climate change, ecosystem degradation and other critical environmental issues." The quality of corporate strategies for managing the risks and capturing the opportunities associated with a carbon constrained economy will likely become more important in investor decisions.

# **INDUSTRY CONSIDERATIONS**

There are several characteristics of the global automotive industry that bear significantly on how we are able to respond to the challenge of climate change. The U.S. industry, in particular, is addressing significant and well-publicized structural challenges, from legacy and health care costs, to excess manufacturing capacity, to high costs in our supply chain.

First, our business involves a *long product lifecycle* with greenhouse gas emissions that vary at each stage. Only approximately 10 percent of the GHG emissions associated with any given car or truck we make are emitted directly by our plants and facilities. Most of the remaining 90 percent of the emissions attributed to any vehicle over the course of its lifetime is emitted during its use by the consumer. This means that addressing lifecycle GHG emissions depends on engaging consumers on their purchase decisions, driving behavior and their choice of fuels.

Second, we face at times *conflicting regulatory, market and technological signals*. The picture varies by geography, market segment, and demographic profile. For example, governments are often tempted locally to encourage specific technology solutions, but there is considerable uncertainty about which technologies, combinations of technologies and technology pathways will prevail and over what time frames, and governments are rarely best equipped to pick technology winners and losers.

Also, some policy makers favor demand-side measures such as fuel taxes and Green Public Procurement policies, while others prefer supply-side controls such as fuel-economy or GHG emissions standards, creating significantly different market dynamics and product strategies from one region to another.

And often regulations designed to promote different public goods directly compete with one another; for example the addition of new safety technology to vehicles often drives up weight which in turn has a negative effect on fuel economy. And all these conflicting signals drive costs into our products which cannot always be recovered in the sales price.

Third, the GHG footprint of the in-use phase of light duty vehicles must be measured on a *well-to-wheels* basis, that is, the total emissions from the production of the original source of energy (e.g. crude oil, bio-fuels, etc) into a usable fuel, the amount of energy consumed to produce the vehicle, to the fuel consumed by the vehicle during its in-use lifetime.

Fourth, the automotive industry operates on *long product development times and major capital investments*. It can take four or more years and billions of dollars to bring a totally new vehicle and powertrain from the drawing board to the show room floor. The long time frame and heavy financial commitment underscore our fiduciary responsibility to carefully weigh the risks of investing our shareholders' capital on products with uncertain prospects. They also highlight the need for more certainty -- stable and predictable pricing signals and policy frameworks.

# Strategic Roadmap

# STRATEGIC PRINCIPLES

Going forward, our approach to GHG stabilization will be based on some key principles.

First, technical, economic and policy approaches to climate change need to recognize that all CO<sub>2</sub> molecules (or GHG equivalents) produced by human activity make the same contribution to the atmosphere's concentration of greenhouse gases. The cost of mitigating those emissions, however, varies significantly depending on their source, and *economically efficient decisions about how to reduce emissions depends on transparent cost signals*.

The road transport sector is commonly perceived as a low-cost target for emissions reduction. The light duty vehicles fleet in particular is characterized by a low consumer elasticity of demand for mobility, long lags in vehicle design and slow turnover in the vehicle stock (e.g., 15-20 years), and lack of a practical large-volume substitute for petroleum-based fuel. It also lacks easy access to emissions-reducing mechanisms available in other sectors such as fuel-switching to less carbon intensive sources and carbon capture and storage. The relatively high costs of emission reduction make it important that control policies be as efficient as possible, which implies that the marginal costs of compliance be equalized across sectors.

Among other things, this means that while reducing GHG emissions from the road transport sector will be an important element in addressing long term climate change concerns, care should also be taken to achieve the most economically cost-efficient reductions. A pure pro-rata assignment of burden for reducing GHG emissions across individual sectors without the ability to trade-off costs and benefits may not be the most appropriate response.

Second, relative to in-use GHG emissions, the auto industry represents a closely interdependent system, characterized best by the equation: *fuel* + *vehicle* + *driver* = *GHG emissions*. That means, simply, that the total in-use GHG emissions of any given vehicle depends on the carbon content of the fuels that fuel companies bring to market, combined with fossil fuel efficiency of the vehicle itself, combined with the fuel choices, vehicle choices, miles driven and driving behaviors made by the consumer. This point of view that fuel, vehicle and driver are all critical stands in contrast to policy prescriptions that focus solely on vehicle technology and design.

Each link in this chain depends on the others. For example, fuel companies can produce a range of fuels with varying carbon content, but successfully bringing those fuels to market depends on consumer demand and a critical mass of vehicles equipped to use alternative fuels.

Similarly, auto companies can (and do) provide a wide range of products with varying fuel economy performance. The deployment on the road of more fuel-efficient vehicles depends on consumer preference and willingness to pay and – in the case of alternative fuel powertrains – the availability of low-carbon alternative fuels.

And consumers can affect thier own GHG emissions by making decisions about how they drive, how many miles they drive, what modes of transportation they choose to use, which cars or trucks they purchase, and which fuels they buy.

Importantly, in a system in which no single player controls all inputs, changes in output – in this case GHG emissions – will require unprecedented coordination across all sectors.

Third, the future developments of technologies, markets, political expectations and even the natural manifestations of climate change are all uncertain. That means that the business strategies we implement – and the public policies that we encourage – will be based on the *flexibility to meet a range of potential scenarios*. For us that means developing and maintaining the flexibility and capability to respond to changes in consumer demand, new technological breakthroughs, competitive actions and regulations. It also means that it is in our business interest to work to reduce uncertainty and increase the predictability of policy frameworks and market conditions.

We know that almost any scenario will call for reduced fossil GHG emissions, but inside that broad directional expectation lie a host of conflicting possibilities. Will GHG reductions be driven by fuel efficiency, energy security, or pocketbook concerns? Will hydrogen, bio-fuels, battery electricity, diesel or some combination emerge as the powertrain technology of choice? Will the emerging markets of China and India pursue a unique path toward low GHG emissions in their road transport sectors?

Finally, *early, affordable steps to reduce GHG emissions and improve fuel efficiency* may delay the need for drastic and costly reductions later. Lack of agreement on long term solutions cannot be used as an excuse to avoid near term actions.

# STRATEGIC ACTIONS

Our long-term strategy is to contribute to climate stabilization by

- · continuously reducing the GHG emissions and energy usage of our operations.
- developing the flexibility and capability to market more lower-GHG-emissions products in line with evolving market conditions.
- working with industry partners, energy companies, consumer groups and policy makers to establish an effective and predictable market, policy
  and technological framework for reducing road transport GHG emissions.

# Product

Our evolving product portfolio is by far the most important element of our strategy for (and contribution to) a climate stabilization goal.

Our product GHG strategy is unfolding in a series of overlapping phases:

*Technology pilots* in which we are accelerating our steps toward integrating innovative fuels, efficiencies and GHG reductions into our product cycle plan and building the capability to innovate further.

Scaling Up in which we take innovative technologies across a range of platforms and develop the full capability to move forward with the most promising technologies in packages that are competitive on performance and convenience;

Mass Marketing in which low GHG vehicles achieve penetration across vehicle categories and represent significant market share; and

*Drive to Stabilization* in which low GHG vehicles reach dominant market share and fleet CO<sub>2</sub> emissions converge with a target global stabilization curve.

We have announced publicly several product actions that will increase the number of higher fuel economy, lower GHG emissions vehicles available to our customers, and others we have not announced for competitive reasons. For example, we have already announced plans to expand our capacity to build hybrid electric vehicles to 250,000 units per year by 2010. We are also expanding the application of existing technologies that deliver fuel economy benefits including variable valve timing, fuel shut off, direct injection gasoline engines, clean diesel, and six-speed transmissions.

In addition, we will increase our investment in a portfolio of technologies that deliver improved fuel economy and lower GHG emissions, including:

- Weight stabilization and reduction
- · Expanded FFV vehicles and partnerships with fuel providers to increase infrastructure
- · Gasoline engine downsizing, combined with Direct Injection Spark Ignition (DISI) and pressure charging
- Hybrid gasoline powerpacks, shared among the brands
- Clean diesels and the technology to allow them to run on biodiesel above 5% blends
- In Europe, diesels with partial hybrid technologies such as engine stop start, regenerative braking, parallel lithium-ion batteries or super-capacitors
- Hydrogen Internal Combustion Engine (ICE) demonstration fleets
- · Hydrogen fuel cell research and demonstration fleets

At the portfolio level, the mix of vehicles we sell will continue to be dictated by the marketplace, but we believe that the trend towards more fuel efficient vehicles, such as cross-over vehicles and smaller SUVs will continue. In addition, by utilizing common platforms, we will be able to offer greater fuel economy across a wide range of product designs. Specifically, we will be better able to apply weight reductions achieved in one model to other models without compromising safety, quality or performance.

We are also moving to a system that makes greater use of set combinations of engines and transmissions or Powepacks. An increasing portion of our products will employ these powerpack drivetrains which are optimized for fuel efficiency.

Our plan also includes innovations aimed at the fuel part of the equation. In the last decade we have produced over 1.5 million flexible fuel vehicles and beginning in 2006, we will offer an expanded line up of flexible fuel vehicles (FFV) capable of using fuel blends with up to 85 percent bioethanol. While current bio-ethanol production in the US does not provide a substantial reduction in GHG emissions on a well-to-wheels basis, having a substantial fleet of FFVs in operation is a bridge to widespread use of lower carbon bio-fuels in the future.

The potential exists for expanding production of bio-ethanol from cellulosic sources that would lead to further significant reduction in lifecycle GHG emissions, but only if we pursue a policy agenda designed to do so. If the five million FFVs (industrywide) on the roads today were operated solely on fuel blends of 85 percent bio-ethanol based on celluslosic feedstocks, this could displace as much gasoline and provide nearly the same GHG benefits as about 10 million new hybrid vehicles.

We already have begun positioning our fleet for a future in which bio-fuels play a more significant role. In September 2005 we announced we would introduce a new line of flexible fuel vehicles (FFVs) in the U.S. including the world's best selling vehicle – the Ford F-150 – which can use blends up to 85 percent ethano, as well as take proactive steps to support expanded availability of bio-ethanol and customer awareness of the advantages of FFVs.

In Europe, Ford was the first manufacturer to introduce FFV technology when it launched the product in Sweden. In 2005 Ford took the step of making the Focus FFV available across Europe and is presently looking at a number of potential partners to explore the possibilities and feasibility of developing a bio-ethanol fuel infrastructure.

# Policy

From a global business perspective, we see a significant amount of political activity around energy security, energy diversity and climate change.

Going forward, we are committed to participating in - and leading, if necessary - a dialogue on energy policy and greenhouse gas emissions that promotes more energy security and lower GHG emissions across the entire economy, while ensuring stable economic growth and the viability of our business.

At Ford we believe policies that put constraints on carbon need to focus on all sectors of the economy. They should encourage conservation and the introduction of lower-carbon fuels and energy sources, while increasing the demand for more energy efficient products across all sectors at the lowest possible social cost and at a pace consistent with consumer demand and economic viability. These policies need to be implemented in ways that mitigate any related transitions to avoid economic disruptions and unnecessary costs, with incentives playing a key role.

We also believe that in the transportation sector, vehicle, fuels and fuel-use must be addressed as a system. Also, broad GHG policies in the U.S., Europe or other markets need to focus on pursuing the most-efficient and cost-effective ways to reducing fossil energy use and GHG emissions. Future reduction programs should be based on upstream, carbon trading systems that establish reasonable, gradually reducing the limits on carbon introduced into the economy. In addition, they must include a safety valve that is based on economic/energy indicators that would allow for the release of additional emission allowances at reasonable prices to avoid unintended constraints on economic growth, maintain price stability and protect vital economic growth and social development needed to help spur demand for more efficient products and support long-term investment, research and an innovation.

Future policies need to encourage the use of lower-carbon fuels and energy (e.g., bio-ethanol fuels and blends) through favorable market signals and incentives, as well as encourage energy efficiency, carbon sequestration initiatives, offsets, and credits across all phases of the energy value chain. We believe that a properly structured, upstream system would allow all sectors of the economy to respond to the market signals and pursue the most cost-effective solutions to improve energy conservation and energy efficiency. From a transportation point of view, an effective system would require gradual but dramatic changes in our product and technology mix to remain consistent with shifting consumer demand for more efficient products.

There are no simple solutions and open debate among all the diverse stakeholders is necessary. A long-term solution will take time to evolve, but we also believe that early, foundational policies can help reduce GHGs. For example, educating consumers on their role – through programs like ecodriving training – will be a very important part of a comprehensive and consistent market-based solution. We also must focus on vehicle performance through advanced technology research and development as well as manufacturing incentives that reach through to suppliers and OEMs. And we must continue to pursue policies that improve road transport and infrastructure (e.g. mass transit) by reducing congestion and fuel consumption through improved traffic flow.

# **Plants**

GHG emissions in manufacturing account for about 10 percent of the total emissions over the lifecyle of a vehicle. Since 2000, we have cut the GHG emissions from our facilities worldwide by more than 15 percent. We're also on track to meet a five year goal of improving the energy efficiency of our plants by 14 percent, normalized for changes in production.

We continue to make and meet new commitments to reducing our energy use and GHG emissions. Through our participation in the Chicago Climate Exchange, we've made a commitment to reduce the GHG emissions from our North American operations by six percent by 2010. Likewise, our plants subject to the UK Emissions Trading Scheme must reduce their GHG emissions by five percent over five years. We are the only auto manufacturer participating in these voluntary programs and Ford has successfully received the required third-party verification of our emissions reductions annually. Our involvement in these trading initiatives builds our capability to manage our overall emission profile while advancing these important efforts to integrate a value for GHG emission reductions into the day-to-day world of financial management.

In addition to reducing our energy use, we've also led efforts to make more electric power available from renewable energy sources with lower GHG emissions and that contribute to energy security. We have the world's only automotive plant powered entirely by on-site wind turbines at Dagenham in the UK. We also use methane gas from landfills at our Wayne Assembly Plant.

# People

Communications and education of consumers and employees is an important key to reducing energy use and GHG emissions. We can provide employees and customers with both information and the proper tools to enable them to be a part of the solution.

Our emission offset program is one way to begin educating customers about climate change and GHG emissions. In September 2005, we announced that we would pilot a program to offset the  $CO_2$  emitted from the production of our hybrid vehicles in the U.S. The purchase price of the offset is applied to a project that reduces or sequesters the emission of  $CO_2$  elsewhere.

We also will be developing materials designed to help consumers' understanding of what an offset is and how they can act on further opportunities – by offsetting the  $CO_2$  emitted when they drive their vehicles.

We also have been piloting Eco-driving programs in Europe, Canada and in the U.S. to educate consumers about how their specific actions affect the GHG emissions of their vehicles. By driving in a more careful and environmentally responsible way, individuals can cut exhaust emissions, save fuel and money at the pump. Research has shown that many individuals can reduce their fuel consumption by approximately 20-25% by just following a few simple steps.

And we're bringing that initiative to our own employees. An employee Eco-Driving program will be rolled out to all US salaried employees during the first half of 2006. We hope to expand the program globally, including a rollout to suppliers and consumers, as well. This web-based training is designed to heighten employee awareness of driving behaviors and their relationship with emissions and fuel economy.

We also are supporting efforts to educate fuel consumers about the importance of which fuels they use. Ford recently announced an initiative with VeraSun, a provider of bio-ethanol blends. Critical to acceptance of bio-ethanol fuel is consumer awareness. Ford and VeraSun will launch an informational campaign to educate consumers on the benefits of bio-ethanol as an alternative fuel.

# **Partnerships**

The systems approach to reducing GHG emissions confirms the importance of strong and diverse partnerships. Our existing partnership with Ballard Power Systems on fuel cell vehicles is an example of a partnership focused on technology development. We also have partnerships with BP on developing special lubricants and fuels that will reduce GHG emissions.

Within our supply chain, we will build significant capacity to deliver low GHG emission vehicles. We need to expand the focus of our supplier relationship to include the value that suppliers will need to bring to our expanded capabilities. Cost will always remain a key criterion, but overall system performance will increase in importance.

We've mentioned our current and future efforts on FFVs in several sections. Our partnership with VeraSun, a provider of bio-ethanol fuels, will both expand the infrastructure needed to bring bio-ethanol to customers and engage those customers on the merits of bio-ethanol and FFVs.

We are involved in several important research partnerships with implications for climate change. In some cases, Ford is leading the research. Examples include research on the inter-relationships between air quality and climate change as well as on the potential emission issues associated with a hydrogen fuel system. In other instances, Ford supports research related to climate change. Examples include our partnership with the Princeton Center for Energy and Environmental Studies and the MIT/AGS project.

# Conclusions

Ford Motor Company views stabilization of greenhouse gases in the atmosphere and energy security as critical and related business issues that warrant precautionary, prudent and early action. It is our hope that this report will lead to a better understanding of the business implications for the automotive industry and to more predictable policy frameworks and market conditions.

This report is not the last word you will hear from Ford on the subject of climate change. We continue to work on technology, policy, marketing and product initiatives that we expect will move the issue – and our business – forward over the near to medium term.

In the meantime, we are acting on the principle that a sustainable approach to the reduction and stabilization of GHG emissions in the road transport sector needs to be approached as a system and be introduced at a pace consistent with consumer acceptance and the financially viability of the industry. We believe that there is need for a strategic approach to stabilization that makes appropriate cost-benefit tradeoffs. We need to focus on the most environmentally and economically efficient and effective way to reduce emissions with a goal of stabilization. And we are convinced that our long-term business competitiveness will benefit by leading the development of market-based solutions to the climate change issue, both on our own and with partners.

# Climate change

# **APPENDIX 1**

Excerpt from 2004-2005 Sustainability Report

COMMITMENT – PRODUCTS	TARGET		
European Automobile Manufacturers Association CO2 commitment	EU new car fleet average of 140 g/km by 2008; equivalent to 25% average CO <sub>2</sub> reduction compared with 1995.		
Australia fuel economy commitment	Fuel economy of 6.8 I/100 km by 2010 from 2001 level of 8.28 I/100 km		
Canadian Greenhouse Gas Memorandum of Understanding	Industrywide voluntary agreement to reduce greenhouse gas emissions from the Canadian car and truck fleet by 5.3 megatonnes by 2010		
COMMITMENT – OPERATIONS	TARGET		
Global manufacturing energy efficiency	Improve manufacturing energy efficiency by 1% year over year, following an improvement of more than 12% from 2000 to 2004		
UK Emissions Trading Scheme	UK operations to achieve 5% absolute reduction target over 2002-2006 timeframe based upon an average 1998-2000 baseline		
Chicago Climate Exchange	Reduce U.S. facility emissions by 6% over a 2003-2006 timeframe based upon an average 1998-2001 baseline		
Alliance of Automotive Manufacturers	Reduce U.S. facility emissions by 10% per vehicle produced between 2002 and 2012		
REGULATORY REQUIREMENTS			
United States	The United States has set fleet average motor vehicle fuel economy for over 25 years. To date Ford has always met the prescribed standards.		
China	The federal government has introduced weight-based fuel consumption standards for passenger cars and trucks. The standards began with new 2005 model year (MY) passenger vehicles and increase in stringency for new 2008 MY vehicles. Proposed standards for commercial trucks start in 2008. All of Ford's product offerings comply with the appropriate 2005 MY standards and are fully expected to comply with the 2008 MY standards as well.		

# THE CLIMATE CHANGE CHALLENGE

The cars of the 21st century will need to be ever more stylish, safe, spacious, powerful and fuel efficient. The auto companies best able to deliver vehicles that meet these tremendous challenges are likely to increase market share and reap the financial rewards of technological leadership.

Many factors influence greenhouse gas emissions from vehicles, and many institutions and individuals influence those factors (see *Figures 2 and 3*). Reducing greenhouse gases is a global concern that can only be addressed through coordinated international efforts. For these efforts to have meaningful, long-term impacts, global patterns of consumption of fossil fuels must be changed. For the transportation sector, this will require not only improvements in fuel economy, but also changes in fuels, infrastructure, mass transportation and driver behavior, as well as a reduction of the overall number of vehicle miles traveled.

Addressing climate change is a significant undertaking involving numerous actors, but it also represents an opportunity for companies that can

### 2 The role of Ford and the need for collaboration

bring fresh thinking and technological and social innovation to the challenge. We are working internally and externally to understand the business implications of climate change and generate business value by contributing to solutions. For example, we are investing in a broad range of product technologies (see Mobility section), we are making progress on a series of commitments to reduce manufacturing and product greenhouse gas emissions (see *Figure 1*), and we are forming partnerships and collaborative efforts to address the full range of factors influencing climate change.

Ford is affected by fuel economy regulatory requirements and commitments in all of our major markets around the world. We cannot predict the future, but it is unlikely that energy security and climate change concerns will be resolved in the near term. It is more likely that regulations and commitments to improve fuel economy will increase in stringency as policy makers react to these challenges. Ford is in compliance with all fuel economy regulations and is on track to meet all of our voluntary commitments. A summary of many of these commitments can be found in *Figure 1*.

# FORD GOVERNANCE AND ACTIONS

A vice president-level task force appointed by Bill Ford has responsibility for identifying the business implications of the climate change issue and directing the development and implementation of our climate change strategy. During 2004, the task force completed a review of the scientific evidence and implications of climate change. The review concluded that consensus is forming around the appropriateness of a broad societal goal to stabilize atmospheric CO<sub>2</sub> concentrations and explored the implications of this goal for Ford's business. (For a more detailed discussion of stabilization see *Figure 3* on Page 18.)

During 2004 and early 2005, the task force worked in three major areas: establishing an organization and governance process to develop Ford's strategic approach to sustainable mobility (see *Figure 4*); overseeing preparation of a stand-alone climate change report to be issued in late 2005; and planning fuel economy improvements through technological solutions. Also discussed in this section are our efforts to reduce greenhouse gas emissions from our facilities and our participation in a variety of collaborative initiatives to meet the climate change challenge.

The vehicles we produce have significant impact on society and the environment, including the issue of climate change. We are committed to doing our part to address the climate change challenge. But for all our influence, we can only succeed if we work on the factors influencing greenhouse gas emissions from vehicles in partnership and collaboration with other actors including:

Energy companies. Provide different types of fuel and influence public policy. *Factors: fuel cost and availability; fossil carbon content of fuels*Suppliers. Offer innovative materials, technologies and components
Fellow automakers. Share learning and technologies and influence consumers and public policy. Provide vehicles/mix of vehicles *Factors: marketing; vehicle fuel efficiency (CAFE)*Capital markets. Account for risks and influence actions of companies and investors

Labor. Shape and implement solutions and influence public policy

Dealers. Inform consumers and service new generations of vehicles



Governments and policy makers.

Create regulatory environments governing markets and behaviors, and establish infrastructure for new fuels and technologies *Factors:* price signals/fuel taxes; infrastructure development

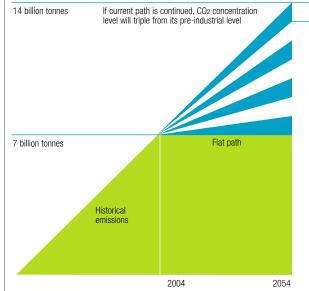
Customers.

Choices about types of vehicle purchased and driving behavior

*Factors:* number of vehicles; choice of transportation mode; vehicle usage patterns; vehicle miles traveled

Nongovernmental organizations. Affect public opinion and policy and influence consumers. Collaborate with companies

### 3 Climate stabilization



#### 1 wedge = 1 billion tonnes of carbon emissions

#### Each of the following strategies has the potential to reduce carbon emissions by one wedge.

#### Efficiency

- Double the fuel efficiency of 2 billion vehicles
- Decrease the number of vehicle miles traveled by half
- Use best efficiency practices in all residential and commercial buildings
- Produce current coal-based electricity with twice today's efficiency

#### **Biomass fuels**

 Increase ethanol production 50 times by creating biomass plantations with an area equal to one-sixth of world cropland

#### **Carbon capture and storage**

- Capture AND store emissions from 800 coal electric plants
   Deadure budges from each at air times to dayle and
- $\bullet$  Produce hydrogen from coal at six times today's rate and store the captured CO\_2
- Capture carbon from 180 coal-to-synfuels plants and store the CO<sub>2</sub>

#### Nuclear

 Add double the current global nuclear capacity to replace coal-based electricity

#### Wind

- Increase wind electricity capacity by 50 times present value, for a total of 2 million large windmills
   Solar
- Install 700 times the current capacity of solar electricity
- Use 40,000 square kilometers of solar panels (or 4 million windmills) to produce hydrogen for fuel cell vehicles

# Fuel switching

 Replace 1,400 coal electric plants with natural gaspowered facilities

#### Natural sinks

- Eliminate tropical deforestation and create new plantations on non-forested land to quintuple current plantation area
- Adopt conservation tillage in all agricultural soils worldwide

We have been a leader in our industry in acknowledging and speaking out on the significance of climate change. Since we began to address the issue, we have continuously tracked the evolving views of the scientific and policy-making communities on the subject. For example, many scientists, businesses and governmental agencies have concluded that stabilizing the atmospheric CO<sub>2</sub> concentration at 550 parts per million (ppm) (compared with the current 380 ppm and the historical level of approximately 270 ppm), may help forestall or substantially delay the occurrence of climate change without also incurring tremendous costs and economic hardships on the path to stabilization.<sup>1,2,3</sup> The Carbon Mitigation Initiative, a research partnership based at Princeton University and supported by BP and Ford, has examined what it would take to stabilize atmospheric CO2. Researchers identified a set of stabilization strategies they call "wedges." Each wedge represents the implementation of a strategy that could cut global annual carbon emissions by 1 billion tonnes by 2054. Fifteen different strategies were identified. *Figure 3* above shows that stabilization would require the successful implementation of at least seven of these 15 approaches to achieve the annual reduction of 7 billion tonnes of carbon emissions from business-as-usual forecasts.<sup>4</sup>

While the wedges may be theoretically achievable, they were not evaluated for their economic, market or political feasibility. Many would require rapid scaling-up of emerging technologies. Achieving the reductions represented by any one wedge would require economic, political and technical commitment and cooperation. All sectors of society and industry would need to be involved in the complex process of reconciling the actions required to implement the wedges. No one industry or sector could do it alone.

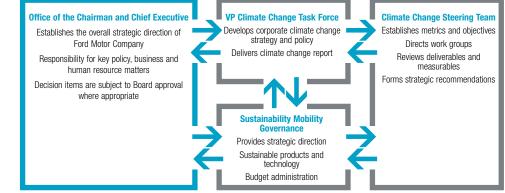
<sup>1</sup> Intergovernmental Panel on Climate Change, "Climate Change 2001:

- The Scientific Basis," Cambridge University Press (2001)
- $^2$  The Arctic Council, Arctic Climate Impact Assessment, www.acia.uaf.edu (2005)  $^3$  Pew Center on Global Climate Change, "Beyond Kyoto: Advancing the
- international effort against climate change," (December 2003)
- <sup>4</sup> Carbon Mitigation Initiative, "Building the Stabilization Triangle, www.princeton.edu/~cmi, (2004).

#### We have established a new cross-functional highlevel governance structure to explore the implications of sustainable mobility and plan

implications of sustainable mobility and plan Ford's future offerings of products and services. The sustainable mobility governance structure is integrated with the climate change task force and steering teams, and both report to the Office of the Chairman and Chief Executive.

4 Climate change and sustainable mobility governance



# **Climate change report**

Since the 2000 stakeholder dialogue, we have engaged with a variety of groups interested in our climate change strategy. During 2004 and early 2005, we worked with a coalition of shareholders asking Ford to report on the climate change issue. In March 2005 we announced that we would publish a comprehensive report on climate change. The report will examine the business implications of greenhouse gas emissions, with reference to government policies and regulations, Ford's product and manufacturing facilities actions and advanced technology development. We are consulting with stakeholders in the development of this report including Ceres, the Interfaith Center on Corporate Responsibility, the Union of Concerned Scientists and the Natural Resources Defense Council.

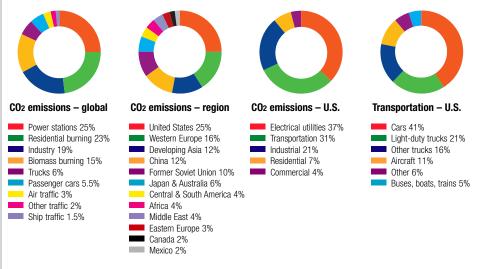
# Fuel economy improvement

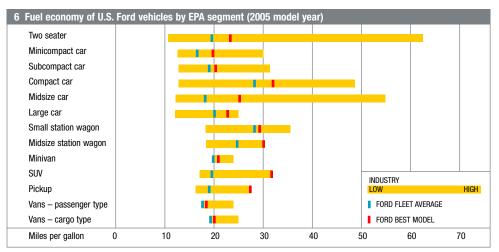
Ford is committed to improving the fuel economy of all of our vehicles. It is also one of our greatest challenges. We are taking near-term actions and aggressively pursuing advanced vehicle technologies to improve the fuel economy of our offerings. Globally, we are incorporating fuel-saving technologies such as five- and six-speed transmissions, electric power-assisted steering, variable cam timing, greater use of lightweight materials and improvements in vehicle aerodynamics. We introduced our first hybrid vehicle, the Escape Hybrid, in 2004 (see Box 7). We are also working to develop a new generation of advanced technologies with lower greenhouse gas emissions, discussed in the Mobility section of this report. Current and near-term actions are described below.

*Economy vs. efficiency.* When describing fuel use in vehicles, there are two important terms to understand. Fuel efficiency measures the amount of fuel (in ton-miles-per-gallon) needed to move a vehicle of a certain weight a certain distance. Fuel economy (in miles per gallon), a much more recognized term, indicates how far a vehicle travels on a unit of fuel. We have made significant improvements in the fuel efficiency of our fleet. The fuel efficiency of our vehicles in the United States improved from 41.6 ton-mpg in 1987 to 49 ton-mpg in 2005. However, the fuel economy of our fleet has not

# 5 Climate change and industry

Climate change is the result of an increase in heattrapping (greenhouse) gases in the atmosphere. Carbon dioxide (CO<sub>2</sub>) is the major greenhouse gas, resulting from the combustion of fossil fuels in human activities including manufacturing; power generation; residential burning; and transportation of people and goods. Ford uses energy to produce our vehicles and power our global facilities, resulting in CO<sub>2</sub> emissions that we measure, report and strive to reduce. However, the vast majority (approximately 90 percent) of a vehicle's lifecycle greenhouse gas emissions occur during the use of the vehicle, when it burns gasoline or diesel fuel from fossil sources. Other important greenhouse gases include nitrous oxide, methane, halocarbon and ozone. Emissions from cars and trucks comprise about 12 percent of man-made CO<sub>2</sub> emissions globally. Cars and light trucks account for 19 percent of man-made CO<sub>2</sub> emissions in the United States.





improved as regulations and the competitive market have demanded safer, cleaner and more powerful feature-laden vehicles.

EPA data for the industry show that the fuel efficiency of vehicles sold in the United States

improved 24 percent between 1987 and 2005. As a point of comparison, 1987 is cited because the industry achieved an average peak fuel economy value that year.<sup>5</sup> During the same period, the

#### <sup>s</sup> Light-Duty Automotive Technology and Fuel Economy Trends: 1975 through 2005, www.epa.gov/otaq/fetrends.htm

average weight of vehicles rose by 27 percent as consumers chose vehicles with additional performance, safety and utility features, and automakers added emission control and other required equipment. Average horsepower almost doubled to 212 hp (from 118 hp in 1987) and the share of light trucks increased to 50 percent (from 28 percent in 1987). The result is that industrywide fuel economy has remained flat since 1987. A list of fuel economy rankings for U.S. vehicles can be found at www.fueleconomy.gov. *Current performance – U.S.* We are making incremental improvements to the fuel efficiency of the vehicles we currently offer. Our new Ford Five Hundred and Mercury Montego sedans, for example, offer a six-speed transmission. The 2005 Lincoln Navigator SUV and Jaguar XJ sedan use our first rear-wheel-drive six-speed transmission, and the Escape Hybrid offers electric power-assisted steering.

The extent to which some of these fuel-saving technologies have been incorporated into our vehicles sold in the United States is summarized in *Figure 8.* We are also investing in new vehicle segments as a strategy to improve fuel efficiency. We continue to expand our offerings of cars and "crossovers" in North America – vehicles that combine the features of cars and SUVs while generally achieving better fuel economy than traditional SUVs.

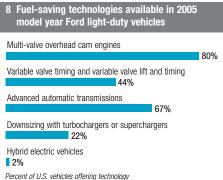
Although our long-term fuel economy performance in the United States has trended down since 1987 (from 24.2 mpg to 22.8 mpg in 2005), our projected 2005 model year corporate average fuel economy improved by 4.8 percent compared with the 2004 model year (see data on Page 40).

Our current product offerings vary in their competitive positioning on fuel economy. Some, including the Escape Hybrid, Ford Ranger and Mazda B2300, are best-in-class. The Ford Five Hundred, Mercury Montego and Ford Freestyle are all near the top of their respective segments in fuel economy. Others are in the middle or lower range compared to the competition (see *Figure 6* on Page 19).

*Current performance – Europe*. In Europe, we have reduced the average CO2 emissions of the vehicles we sell by 11 to 37 percent depending on the brand, compared with a 1995 base (see data on Page 40). We have achieved these reductions by introducing a variety of innovations, from the advanced common-rail diesel engines available on many of our vehicles to the lightweight materials in the all-aluminum body of the Jaguar XJ.

These reductions reflect progress toward the goal of a voluntary agreement between the European automotive industry (represented by its association, ACEA) and the EU Commission. The agreement committed ACEA members to voluntarily reduce the average fleet CO<sub>2</sub> emissions of its new cars sold in the EU. The target is 140 grams of CO<sub>2</sub> per kilometer by 2008, down from 186 grams per kilometer in 1995, which translates to an average CO<sub>2</sub> reduction of 25 percent.

Achieving the 2008 target will be challenging. The agreement is extremely ambitious, both technically and economically. ACEA members are functioning in an uncertain operating environment and must respond to competing demands, such as technological developments and their market acceptance; the EU macroeconomy; geopolitics; customer demands; fuel supplies; new and partly contradicting regulations; and other public policy measures. Despite these challenges, Ford and the industry remain committed to further reduce fuel consumption and the average level of CO2 emissions of the new car fleet.



Technologies identified in National Academy of Sciences report, "Effectiveness of Corporate Average Fuel Economy (CAFE) Standards 2002.

#### Ford Five Hundred





# Cutting greenhouse gas emissions from our facilities

Since 2000, our facilities worldwide have cut their energy use by more than 18 percent and reduced CO<sub>2</sub> emissions by more than 15 percent as a result of steps large and small, from replacing heating and air-conditioning systems to turning out the lights.

We also have increased our use of renewable and other "green" power. During 2004, construction was completed on the London area's first large-scale wind power project, located at Ford's Dagenham Diesel Centre, which produces a high-performance 2.7-liter V6 diesel engine. The two 120-meter-tall turbines meet all the electricity requirements for the Centre (equivalent to 3,000 homes).

Globally, renewable, or "green," power supplies 3 percent of Ford's energy needs. In the United States, we use hydropower, landfill gas, waste gases and other sources to supply 5 percent of our energy needs.

In our paint shops, drying processes and pollution control devices that reduce the release of paint fumes are a significant source of CO<sub>2</sub> emissions. In partnership with Detroit Edison, Ford developed an innovative "Fumes-to-Fuel" system that is moving into its final pilot phase in the fall of 2005, when a portion of the paint booth fumes at the Michigan Truck Plant will be converted into electrical energy to help power the facility.

The fumes, containing volatile organic compound (VOC) emissions from solvent-based paint, are captured, highly concentrated and then burned in a specially designed Stirling Cycle Engine. The engine will produce about 50 kilowatts of electricity. The only byproducts of Ford's Fumes-to-Fuel system, which cuts electrical usage by one-third to one-half, are small amounts of water vapor, carbon dioxide (CO<sub>2</sub>) and nitrogen oxides. The Stirling Engine also produces heat during combustion, which may be another useful source of energy in the future.

The production-scale pilot at Michigan Truck represents the final test of the system before fullscale implementation by the end of the decade as part of Ford's program to deploy new paint shops that are cleaner, smaller and more efficient. As a registered partner of the EPA's Energy Star Program, Ford has implemented industry best practices and new tools to reduce energy consumption.

# Looking at logistics

Over the past five years, Ford's North American operations cut fuel use and CO2 emissions from truck transportation by 15 percent. During 2004 we studied logistics energy use and greenhouse gas emissions as part of the climate change task force deliberations. The purpose was to inform the task force about the contribution of transportation emissions to Ford's environmental footprint and how it might be reduced. Along with lower emissions, the reduction in truck miles has helped Ford achieve freight savings as part of its revitalization plan that began in 2000.

Similar work is taking place in Europe. We are gathering data from major plants to document fuel use and CO<sub>2</sub> emissions attributable to incoming and outgoing logistics. We have made improvements in our European operations by using lower-emission modes of transport. For example, we use river barges instead of trucks for vehicle transportation and trains rather than trucks to take material to our assembly plant in Turkey. We also use the latest diesel engines and instruct truck fleet drivers in economical driving to reduce fuel consumption.

# COLLABORATION AND COOPERATION: A SYSTEMS APPROACH

Energy security concerns, growing scientific evidence on climate change and sustained high fuel prices are adding to the urgency of action on climate change. Climate change is linked to social concerns including population growth, access to mobility and poverty alleviation. We think it is good business to seek out and offer ways to reduce vehicle emissions while extending the benefits of mobility to the billions of people who currently lack it. However, comprehensive solutions require cooperation between the many stakeholders influencing greenhouse gas emissions, including consumers, policy makers, fuel providers and others. We are working with these and others on coordinated approaches.



At Ford's Dagenham Diesel Centre outside London, a worker assembles a fuel-efficient diesel engine. The facility meets 100 percent of its power needs using wind turbines.

# **Public policy**

Thirty-two percent of our manufacturing CO<sub>2</sub> emissions (2.7 million tonnes) occur in countries that are signatories to the Kyoto Protocol Agreement, which went into force in February 2005. We believe that our participation in voluntary agreements to reduce vehicle emissions in the EU and Canada, our ongoing, target-driven programs to reduce manufacturing emissions and our participation in emissions-trading programs will place us in a good position to contribute to attaining Kyoto goals in those countries.

During 2004 and early 2005, Ford took several actions to address public policy related to climate change.

In April 2005, we joined other automakers in a voluntary agreement with the Canadian government to reduce greenhouse gas emissions from Canada's fleet of cars and light-duty trucks by 5.3 megatonnes by 2010. The agreement is unique, because it recognizes that achieving transportation-sector reductions in greenhouse gases depends on efficient products, as well as consumer purchase and driving behaviors and the availability of appropriate fuels.

We continue to work toward implementation of the ACEA agreement on reducing greenhouse gas emissions from vehicles, although it is increasingly challenging (see discussion on Page 21).

Earlier this year, the United States initiated discussions with Australia, China, India, Japan and South Korea to seek a framework agreement on clean development and climate change policies. The negotiations produced a new partnership between the six nations to accelerate the development and deployment of clean, energyefficient technologies. The Asia-Pacific Partnership on Clean Development reportedly aims to identify, promote and deploy global solutions to reduce greenhouse gas emissions and establish clean development programs. We applaud this framework agreement between developed and emerging nations and support its stated goal of accelerating the introduction of clean, affordable and efficient technologies and practices in emerging nations. Specific programs and initiatives are scheduled to be developed later this year. Ford welcomes the opportunity to work with the parties of the Partnership to help deploy sustainable policies and solutions.

Ford supported passage of the U.S. Energy Policy Act of 2005. By incorporating national conservation initiatives, renewable fuel standards and consumer tax credits for fuel-efficient advanced-technology vehicles, including hybrids, we believe that the provisions of the Act will provide incentives to accelerate the expansion of fuel-efficient, advancedtechnology vehicles and achieve the volumes needed to make them more affordable. We also supported the Act's approach to addressing climate change through market-based incentives, which we believe will support U.S. jobs and encourage the deployment of lower-greenhouse-gas-intensive technologies and infrastructure. In addition, these incentives will maintain a national focus on the climate change issue by accelerating the deployment of technologies that can reduce greenhouse gas emissions, and may serve as a template for other nations' acts.

New CAFE standards were not legislated in the Energy Act, as policy makers and industry recognized that there is a regulatory process in place and that the National Highway Traffic Safety Administration (NHTSA) is in the process of reforming the CAFE system and continuing to set standards at maximum feasible levels on an ongoing basis.

We expect to be a constructive partner in developing climate change approaches in all the markets in which we operate. In the past year, in addition to responding to legislative and regulatory proposals, we have called for national dialogue to identify common ground and explore alternative policy approaches that will cut CO<sub>2</sub> emissions from vehicles in a way that is effective, efficient and equitable.

# Strategic partnerships in our supply chain

We have established two major strategic partnerships and fostered collaboration on sustainability issues, including climate change, with many of our major suppliers.

**BP**. In our cooperation with BP, we are taking advantage of natural synergies between the two companies, including common customers worldwide, strong retail networks, direct linkages between our product offerings (merged value chains), strong complementary technologies and shared interest in developing sustainable business models.

Ford and BP are cooperating in a project supported by the U.S. Department of Energy that is deploying a test fleet of hydrogen fuel cell vehicles in Detroit, Michigan; Sacramento, California; and Orlando, Florida. BP also plans to provide fueling support for Ford hydrogen demonstration vehicles in Europe. We are exploring issues around advanced vehicle technologies and fuels. Another area of technical cooperation will be a joint study of modern diesel technologies, with specific focus on applications for the U.S. market.

# Ballard Powersystems and DaimlerChrysler.

With Ballard Powersystems and DaimlerChrysler, we have worked closely to mature the development of fuel cell vehicle technologies. Ballard focuses on providing fuel cell stacks, and the two automakers focus on fuel cell systems, vehicle integration and manufacturing.

# 9 Ford joins companies advocating climate change leadership

During the first half of 2005, Ford Motor Company was the only U.S.-based auto company to participate in the G8 Climate Change Roundtable, formed to advise on the G8 climate change agenda and serve as a sounding board for policy options. British Prime Minister Tony Blair has made climate change a principal theme of his 2005 presidency of the G8. To support work on the issue, the World Economic Forum convened a group of 23 CEOs of leading companies that met during the Forum in Davos, Switzerland. The companies worked together to develop a statement that they presented and discussed with Prime Minister Blair in advance of the G8 meeting in Gleneagles, Scotland. Mark Fields, Executive Vice President, Ford Motor Company and President, The Americas, represented Ford Motor Company in the process.

Key points of the G8 Climate Change Roundtable statement included:

- Recognition of the responsibility of companies to act on climate change, one of the most significant challenges of the 21st century
- Support for elevating the level of international attention to the issue
- Recognition of the need for systematic action that harnesses market forces and includes consumers in approaches to mitigating climate change on a global basis
- Principles for policy actions
- Suggestions for specific G8 actions

The full statement is available at www.ford.com/go/sustainability.

# 10 Campaigners press Ford on climate change and fuel economy

The climate change and fuel economy issues have provoked some public criticism of Ford's policies and actions. In the year ending in June of 2005, Ford received approximately 188,000 letters and emails on the subject. Many of these communications came from individuals participating in NGO campaigns.

Some messages congratulated Ford on the introduction of the Escape Hybrid and asked that Ford introduce additional hybrid vehicles. Some made specific demands for fuel economy targets, while others asked Ford to demonstrate leadership in the auto industry. Some writers pledged to boycott Ford products. Some expressed support for Ford's actions. Some criticized the NGO campaigns. Letters came from Ford vehicle owners, shareholders and children.

We responded to individuals who wrote personal letters or emailed, and we have met with many of the organizations sponsoring the campaigns. For example, we have met with activist groups such as Rainforest Action Network, Global Exchange and Bluewater Network, all of which have directed campaigns at Ford on climate change and fuel economy issues. We have exchanged information to better understand their perspective and to offer insight into ours. While we share the goal of improving fuel economy and reducing greenhouse gas emissions proactively, we have disagreed on the level of improvement that is achievable within given timeframes. An open letter from Bill Ford to the Center for the New American Dream is posted on its Web site (www.newdream.org). Samples of letters received are available on the Web at www.ford.com/go/sustainability.

**Top supplier collaboration.** In 2001 we established the Ford-Supplier Sustainability Forum. The Forum is a place for sharing best practices, developing future Ford supplier sustainability strategies and metrics, and helping us better communicate and refine our social and environmental policies. This forum has provided a venue for discussion of climate change. Our suppliers are important partners in addressing climate change. Their manufacturing emissions comprise part of the lifecycle emissions associated with our products. They are also critical in their role of providing and participating in the development of technologies to help reduce the emissions from vehicles in operation. We have not adopted a policy to measure the quantity of emissions generated by our entire supply chain. However, Ford of Europe is piloting a study of the greenhouse gas impact of its material choices and its logistics footprint. In addition, our efforts to encourage and, in some cases, require suppliers to implement robust environmental management systems will help them report their emissions inventories in the future. We also will seek out opportunities to partner with suppliers to improve the greenhouse gas emissions performance of our products.

### **Emissions trading**

Ford Motor Company is playing a leading role in the development of voluntary emissions trading initiatives in Europe and North America. Ford was the only automaker involved in the UK voluntary emissions trading program, which began in 2002, and is the only auto manufacturer participating in a similar voluntary program in North America, the Chicago Climate Exchange. Under both initiatives, companies like Ford accepted emissions reduction targets. Companies that exceed their targets receive credits that either can be saved for future use or sold on the open market to other member companies that fail to meet objectives. We believe that this market-based approach can promote environmental improvements more cost-effectively than traditional regulations.

The European Union introduced a mandatory Emissions Trading Scheme (EU ETS) at the beginning of this year to support its emissions reduction objectives under the Kyoto Protocol. The EU ETS, which consists of an estimated 10,000 facilities that produce 1.8 billion tonnes of CO<sub>2</sub> annually, sets emissions targets for each company based on an overall CO<sub>2</sub> objective for the region.

Ford has 15 facilities that are regulated by the EU ETS, which initially covers specific industrial activities, including boiler houses, electric utilities, steel plants, and pulp and paper manufacturers.

Ford's experience with voluntary emissions trading programs has helped us prepare for the new EU ETS and allows our Company to enter productive discussions about market-based approaches in other countries. We would like to see these programs become harmonized to accommodate trading across different regions.

# **Consumer behavior**

The roles of drivers and traffic management are critical factors in terms of real-world emissions. A recent study conducted by the Institute of Transportation Engineers and the U.S. Highway Administration, for example, showed that \$1 billion per year spent on improving traffic signals in the United States would not only cut journey times, but also would improve the fuel economy of every vehicle on the road by 10 percent.

In Germany, Ford has trained more than 8,000 people in "eco-driving," a style and method of driving that improves fuel economy by 25 percent, thus cutting CO<sub>2</sub> emissions by 20 percent. Through tests with a major fleet operator, the "eco-driving" style also has been shown to reduce road accidents up to 35 percent.

Ford began training drivers in 2000, in partnership with the German Federation of Driving Instructor Associations and the German Road Safety Council. Several versions of the training are available to different kinds of driver including professional drivers, driving instructors, fleet managers and the general public. Ford dealers in Germany offer four hours of training to anyone with a valid driver's license.

The "eco-driving" method requires only modest adjustments to the driver's behavior ("eco-driving" tips are available on the Web at www.ford.com/go/ sustainability). The program has been evaluated by third parties, which have affirmed the fuel savings and the lasting impact of the training. Because of the multiplier effect, approximately 1 million German novice drivers annually come on the road "ecotrained" via train-the-trainer seminars for driving instructors. Therefore the impact of the program extends well beyond the 8,000 participants to date, and is estimated to include up to 500,000 tonnes of CO2 savings from novice drivers. Ford has also been working with the Wisconsin Department of Natural Resources to develop a simulation game designed to help students understand the relationship between transportation and the environment, and the impacts of their choices and driving habits.

Scheduled for release in late 2005, XRT:eXtraordinary Road Trip (XRT) allows students to experiment with multiple drivers, behaviors and transportation technologies to learn how their choices affect emissions. XRT "drivers" will be able to play again and again, zooming through various conditions and situations in the simulation adventure and learning how to analyze the variables affecting a vehicle's efficiency and the environment.

# Research

In 2004, more than half of our research and development budget was devoted to technologies that will reduce the environmental impact of our vehicles and facilities. Our Research and Advanced Engineering scientists and engineers collaborate with scientists around the world and have made important contributions to fundamental climate change science. They also lead the development of new technologies to save fuel and cut greenhouse gas emissions from our vehicles.

In addition to the Carbon Mitigation Initiative (see *figure 3* on page 18), we are a sponsor of the Massachusetts Institute of Technology Joint Program on the Science and Policy of Global Climate Change and the Alliance for Global Sustainability.

# Reporting

We routinely report on the climate change issue and our greenhouse gas emissions in this report. We have submitted data on our 1998–2004 U.S. emissions to the U.S. Department of Energy 1605(b) Greenhouse Gas Registry, we participate in the Carbon Disclosure Project and we register our North American emissions as part of our commitment to the Chicago Climate Exchange. We have actively participated in and supported the development of the WRI/WBCSD Greenhouse Gas Protocol (www.ghgprotocol.org) because of the need for a common voluntary greenhouse gas accounting and reporting standard.

# Looking ahead

This section has set out our current perspective on climate change, our progress to date, and the opportunities and challenges still before us.

The picture we have presented here is one of unresolved dilemmas. For example, we are grappling with the tension between:

- Our desire as corporate citizens to see reductions in fossil energy use, versus the fact that in many markets, it is high-fuel-consuming vehicles that provide significant profits
- Our desire for more effective and equitable government policies that address climate across all sectors, versus the need to defend our own competitive interests under current policy frameworks
- Our desire to contribute to meaningful solutions to the issue of climate change, versus the lack of agreement among national governments, investors, advocacy groups, consumers and even scientists as to what those solutions should be
- Our recognition that climate change is a major and growing environmental, social and economic challenge, versus the slowness of markets and policy makers to provide signals on which we can responsibly act
- Our participation in meeting the rapidly growing transportation needs in emerging markets, versus

the challenge of restraining related growth in greenhouse gas emissions in those markets

 Our acceptance of a key role for automakers in addressing climate change, versus our rejection of some views that hold our industry uniquely responsible for solutions to this multidimensional problem

We are taking a thoughtful and systematic approach to the issue. Our top leadership is engaged in planning and executing our strategic response, and climate change considerations are increasingly integrated into our business systems and decision making. You will see a much more detailed analysis of these dilemmas and our approach to them when we publish the dedicated climate change report in December.

# **APPENDIX 2**

# California GHG regulations

In 2002, the California legislature passed a law directing the California Air Resources Board (CARB) to promulgate rules limiting greenhouse gas emissions from motor vehicles. In 2004, CARB voted to adopt a set of fleet average standards expressed in grams per mile of CO<sub>2</sub>. Final rules incorporating these standards were adopted in 2005. The standards are set to take effect beginning with the 2009 model year and become increasingly stringent through the 2016 model year. Several other states, including New York, Connecticut, Massachusetts, Vermont, New Jersey, Pennsylvania, Rhode Island, Oregon and Washington, have either adopted parallel regulations or are in the process of doing so.

Ford supports the reduction of vehicle CO<sub>2</sub> emissions and is working aggressively toward the development and implementation of real, market-based solutions. However, the entire automobile industry is united in opposition to the AB 1493 rules because they constitute state fuel economy standards. The federal Corporate Average Fuel Economy (CAFE) law calls for a single, nationwide fuel economy program and prohibits individual states from regulating vehicle fuel economy. State-by-state regulation of fuel economy is unworkable because it raises the prospect of an unmanageable patchwork of state standards. Moreover, the AB 1493 regulations seek to impose a fuel economy task that is far more steep and severe than any that has been ever been imposed in the history of CAFE. As time passes and the standards grow more stringent, many if not all manufacturers will have to severely restrict or eliminate sales of larger cars and trucks in order to maintain compliance. Even with our commitment to step up hybrid production and embrace innovative technologies, Ford would not be able to comply with these standards without restricting our product lineup over time.

In December 2004, the Alliance of Automobile Manufacturers filed an action in federal court in California seeking to overturn the AB 1493 regulations. All members of the Alliance (BMW, DCX, Ford, GM, Mazda, Mitsubishi, Porsche, Toyota and Volkswagen) supported taking this action. The Association of International Automobile Manufacturers (AIAM), which includes Honda, Nissan, Aston Martin, Bosch, Delphi, Denso, Ferrari, Maserati, Hitachi, Hyundai, Isuzu, Toyota, Suzuki, Subaru, Renault, Peugeot, Mitsubishi, Kia and JAMA (Japan Automobile Manufacturers Association, Inc.), has since intervened in the litigation on the side of the Alliance. The litigation process is likely to take several years. A similar action was filed in Vermont in November 2005, and state court actions related to greenhouse gas rules have been filed in New York and Oregon. Additional cases may be filed as other states finalize their rules.

We believe the Company had an obligation to its customers and shareholders to stand with the rest of the industry in support of a single, nationwide fuel economy program with standards that are feasible. In a letter to senior Company management, CEO Bill Ford discussed the Company's opposition to the California regulation and reiterated its commitment to address the climate change issue. (The text of the letter is available at ww.ford.com/go/sustainability).