



Go Further

Sustainability Report 2014/15

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Year in Review

Strategy and Governance

MOBILITY

PRODUCT QUALITY AND SAFETY

CLIMATE CHANGE AND ENVIRONMENT

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SUPPLY CHAIN

COMMUNITIES

# Global Mobility Through Changing Times

Sustainability Report 2014/15

We want to change how the world moves. Again.

*“At Ford, mobility is about far more than motion. It is really about progress. Human progress.”* – Mark Fields, President and Chief Executive Officer



## Spotlight Stories



The new F-150 is Ford's toughest, most capable – and most sustainable – truck ever.



We challenged software developers to help accident victims during the “golden hour” in India.



Ford provides tools, technology and training to help drivers perform their best.



We're developing a globally mobile workforce to deliver innovation.



Can electric bikes link multi-modal travel for commuters? We're experimenting to find out.



## Two-Minute Summary

We are driving to be both a product company and a mobility

company. Our vision is nothing less than to change the way the world moves. At Ford, we view this as the ultimate opportunity. In fact it is as big of an opportunity as when our founder put the world on wheels more than a century ago.

*Take a quick look at what we've achieved this year...*

## Innovating Mobility Solutions

In early 2015, we announced Ford Smart Mobility, which is using innovation to take Ford to the next level in connectivity, mobility, autonomous vehicles, big data and the customer experience. We view the disruption that's taking place in mobility as something to embrace - not fear. We want Ford to be part of the solution by redefining what's possible.

As the first step, in 2014 we kicked off 25 mobility experiments around the globe.

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> [Read more in Mobility](#)

## Offering World-Class Product Quality and Safety

Producing great products is an integral part of mobility innovation. World-class quality and safety are two of the pillars that underpin our approach.

Fifteen of our 2015 model year vehicles earned five stars for overall safety in the U.S. New Car Assessment Program (NCAP), compared to nine for the 2014 model year.

Our 2014 reported "things gone wrong" data shows that our quality is back on track in North and South America and is at best-ever levels in Europe and Asia Pacific.

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> [Read more in Product Quality and Safety](#)

## Delivering Environmental Benefits

We are on course to meet our science-based climate stabilization goal and are implementing a suite of fuel-efficiency technologies across millions of vehicles. In the U.S., we improved the average fuel economy of our combined car and truck fleet by 2 percent in 2014 compared to 2013.

We are also making improvements in our operations to meet our energy, CO<sub>2</sub>, water and waste goals. Globally, we reduced our absolute water use by 3 percent from 2013 to 2014.

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> [Read more in Climate Change and Environment](#)

## Empowering Our People

The skills and talents of our employees enable us to adapt and succeed in changing times. We're counting on our people to push us further, so we can predict and respond to the mobility needs of the future.

In 2014, our global workforce grew by about 6,000 people to 187,000 people strong. We achieved record high Total Employee Satisfaction in the Pulse Survey for salaried employees and the best overall safety track record in the company's history.

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> [Read more in Our People](#)

## Leveraging Our Supply Chain

For more than a dozen years, Ford has promoted sound working conditions and environmental sustainability, working collaboratively with our suppliers and other automakers to raise standards across the automotive supply chain.

A total of 280 supplier companies in six countries were trained in 2014 on corporate social responsibility.

In addition, 95 percent of our strategic production suppliers have a code of conduct aligned with Ford's Code of Human Rights, Basic Working Conditions and Corporate Responsibility.

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> [Read more in Supply Chain](#)

## Supporting Our Communities

We invest in the locations where our employees live and work, focusing on education, driver safety and community life, including environmental and social issues such as the human right to water.

As our business expands globally, so does our community engagement. Our financial contributions and employee volunteer efforts span 48 countries worldwide.

In 2014, Ford invested \$45.6 million in communities and our employees contributed 160,000 volunteer hours – the equivalent of a \$3.5 million investment.

> [Read more in Communities](#)



Our goal is to make connectivity, mobility and autonomous vehicles accessible to millions of people – not just a select few.

> [Letter from William Clay Ford, Jr. and Mark Fields](#)



Materials are an important element of a vehicle's sustainability at all stages of its life cycle.

> [Sustainable Materials](#)



For a quick overview of our performance, take a look at our year by the numbers.

> [Performance Summary](#)



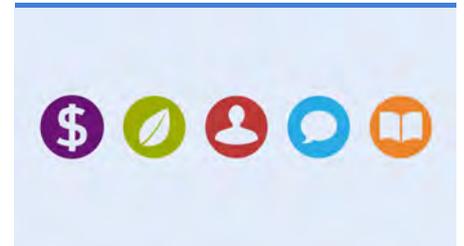
We're a global company – and becoming more global every day. Learn about our progress.

> [Ford Around the World](#)



We strive to be part of the solution by supporting policies that are economically, environmentally and socially sustainable for Ford, our customers and their communities.

> [Public Policy](#)



For this year's report, we took a look at our key issues and how "megatrends" will make them even more pressing in the future.

> [Materiality Analysis](#)

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## Year in Review

Welcome to the 16th annual nonfinancial report of Ford Motor Company. We're proud of how we have been transforming our company – from the vehicles we make to the way in which we make them.



*“Without question, we are embarking on one of the most transformative periods in our history. We understand that the winners will be the innovators, the disruptors and those willing to break with tradition and find new solutions.”*

> [Letter from William Clay Ford, Jr. and Mark Fields](#)

*“At Ford, contributing to a better world is part of our DNA and second nature.”*

> [Letter from Kim Pittel](#)

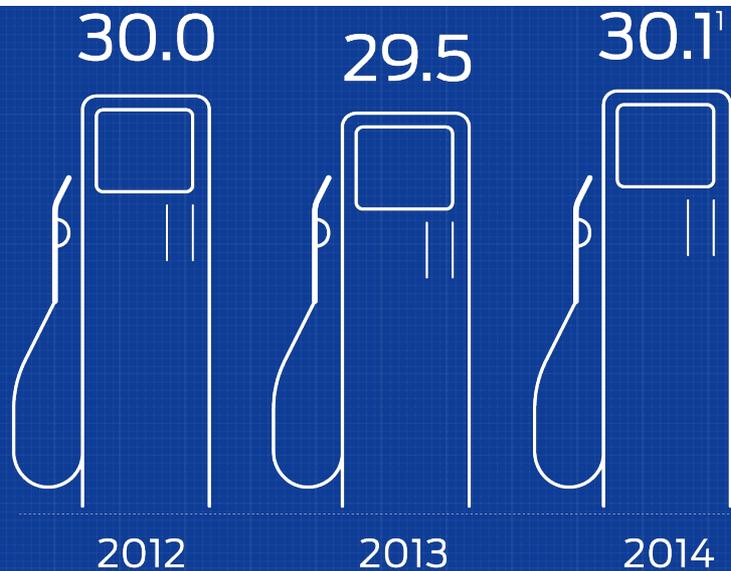
#### 2014 PERFORMANCE HIGHLIGHTS

- > Fuel Economy
- > Vehicle Safety
- > Supply Chain
- > CO<sub>2</sub> Emissions
- > Financials
- > Employee Satisfaction
- > Water Use

### Fuel Economy

IMPROVED

U.S. Corporate Average Fuel Economy, Combined Car and Truck Fleet (miles per gallon)

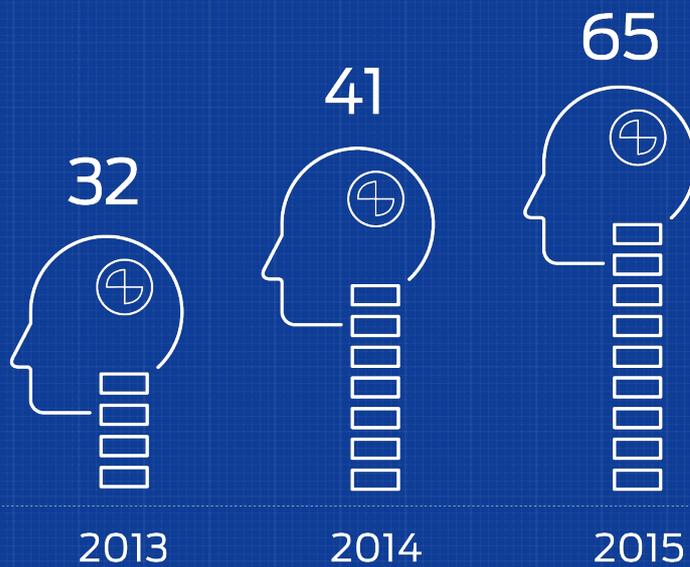


1. In 2014, the average fuel economy of our U.S. car fleet and U.S. truck fleet both remained unchanged compared to 2013. However, our combined corporate average fuel economy improved by about 2 percent due to increased customer demand for cars versus trucks. Our combined fleet CO<sub>2</sub> emissions improved by 9 percent compared to 2009.

## Vehicle Safety

IMPROVED 

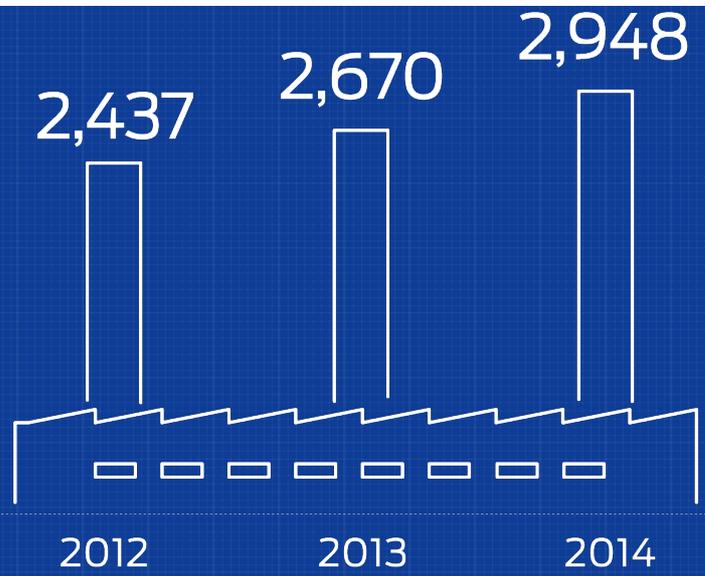
U.S. New Car Assessment Program (NCAP) Five-Star Overall Vehicle Scores (percent of Ford Motor Company vehicles tested that achieved five stars, by model year)



## Supply Chain

IMPROVED 

Total Supplier Sites Trained / Retrained in Sustainability Management (cumulative, since 2005)



## CO<sub>2</sub> Emissions

IMPROVED 

Worldwide Facility CO<sub>2</sub> Emissions per Vehicle Produced  
(metric tons)

0.86



2012

0.78



2013

0.76

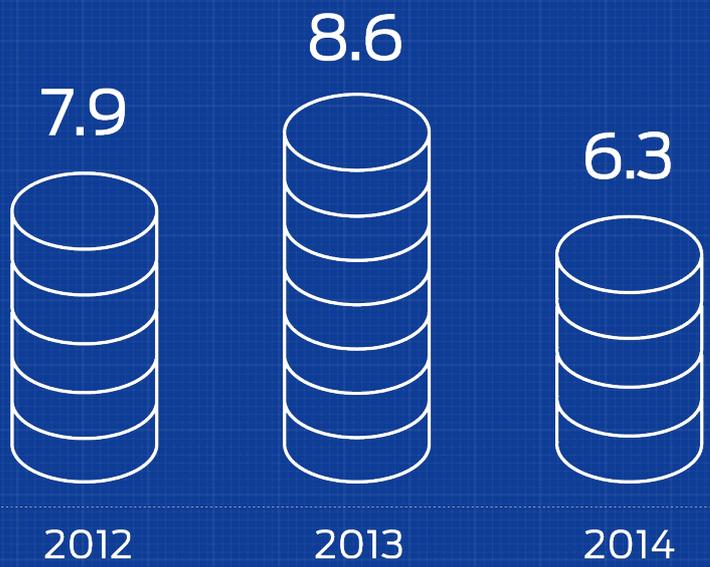


2014

## Financials

DECLINED 

Pre-Tax Profits (excluding special items) (\$ billion)

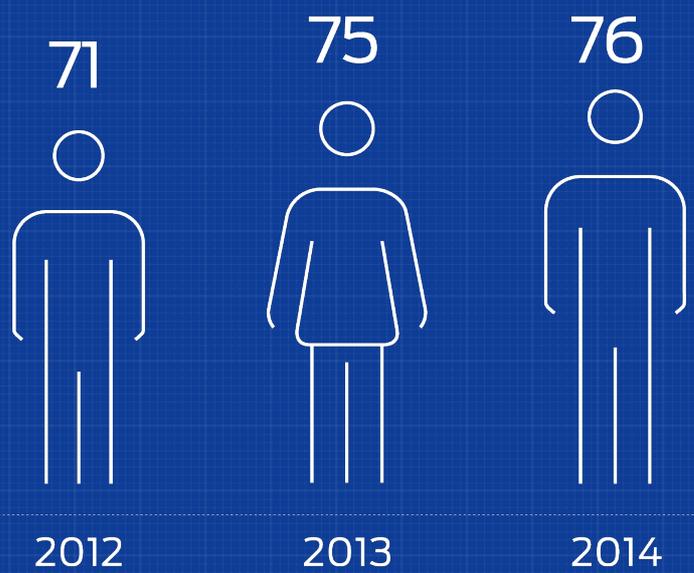


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## Employee Satisfaction

IMPROVED 

Pulse Survey Employee Satisfaction Index (percent satisfied)



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## Water Use

IMPROVED 

Global Water Use per Vehicle Produced (cubic meters)

4.23



2012

4.04



2013

3.99



2014

Performance Summary



Read highlights of some of the key events for Ford during 2014.

> [Map of Our Year](#)



We have set goals, commitments and targets for many of our material issues and other important performance areas.

> [Goals and Progress](#)



In all of our regions, we are taking actions to reduce the environmental impact of our products and facilities, support positive social change and ensure economic viability for long-term growth.

> [Ford Around the World](#)

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# Letter from William Clay Ford, Jr. and Mark Fields



**William Clay Ford, Jr.**  
Executive Chairman

**Mark Fields**  
President and Chief Executive Officer

“ It has been 15 years since we published our first report addressing the economic, environmental and social impacts of our products and operations around the world. During that time, throughout a variety of economic conditions, business cycles and social transformations, we have been reporting on the progress of our sustainability efforts.

We're proud of how we have been transforming our company, from the vehicles we make to the way in which we make them. From water use to human rights to carbon dioxide emissions, we have moved forward and made substantial progress toward a suite of goals and commitments we have set for ourselves.

Between 2000 and 2014, for example, we cut our total global water use by 62 percent, or more than 10 billion gallons, and achieved our original water-reduction goal two years ahead of schedule.

More than 10 years ago, we introduced the world's first hybrid SUV, and today we remain committed to offering customers the “power of choice” for fuel efficiency. In early 2015, we built our 5 millionth EcoBoost®-powered gasoline vehicle. Our fuel-saving EcoBoost technology is now available in every region where we operate and offered on more than 80 percent of our global nameplates.

*“At Ford, mobility is about far more than motion. It is really about progress. Human progress.”*

Mark Fields



President and Chief Executive Officer

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We also have led our industry in groundbreaking work to reduce environmental impacts, and we were the first automaker to take on the issue of human rights to enhance working conditions in the supply chain.

Our efforts were acknowledged in 2014 when we were named by Interbrand as the Best Global Green Brand in the world – the number one company not just in the automotive industry but among all types of businesses. Further validation came in 2015 when we were named to the Ethisphere Institute’s list of the World’s Most Ethical Companies for the sixth year in a row, the only automaker to earn the recognition in each of the last six years.

We are honored to receive these recognitions. Nonetheless, we know our sustainability journey is far from over, and we are determined to go further, particularly as our industry is evolving faster than ever before.

## Our Priorities

As we build on our strong foundation and continue to transform to meet the needs of the future, we are driven by three priorities:

- Accelerating our pace of progress on the One Ford plan
- Delivering product excellence with passion
- Driving innovation in every part of our business

Ford is a growth company in a growing global industry. The past five years mark one of the most consistently profitable periods in our recent history, and we are poised to accelerate our progress in all areas of our business.

We also are a proven innovator, in a period of swift technological advancement. Already, technology has enabled rapid evolution in our vehicles. However, revolutions in connectivity and technology, as well as the changing needs and desires of our customers, are opening avenues for entirely new ways of thinking about our business. It’s not only about cars and trucks. It’s about helping people and things move seamlessly and efficiently using all available modes of transportation.

## Ford Smart Mobility

In 2012, we announced our Blueprint for Mobility, which defines our vision for what transportation will look like in 2025 and beyond, and the technologies, business models and partnerships needed to get there. Our plan outlines a future of connected cars that communicate with each other and the world around them to make driving safer, ease traffic congestion and sustain the environment. We already have put in place many of the building blocks of this future.

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*“Growing up, there was something almost heroic about the car. The automobile represented possibility. I think we are there again.”*



Bill Ford  
Executive Chairman

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Earlier this year, we introduced Ford Smart Mobility, which is our plan to operationalize that vision and use innovation to take Ford to the next level in connectivity, mobility,

autonomous vehicles, the customer experience and big data. We also announced more than 25 mobility experiments around the world to test breakthrough transportation ideas to create better customer experiences, more flexible usership models and social collaboration that can reward customers. You can find more details on the [exciting experiments we are conducting](#), as well as the [global megatrends](#) that are driving our thinking, elsewhere in this report.

We're pursuing Ford Smart Mobility in line with our bedrock conviction that the benefits of breakthrough technologies should be democratized. Our goal is to make connectivity, mobility and autonomous vehicles accessible to millions of people – not just a select few.

## Changing the Way the World Moves

Without question, we are embarking on one of the most transformative periods in our history.

We understand that the winners will be the innovators, the disruptors and those willing to break with tradition and find new solutions. That's why we are pushing ourselves even harder to think, act and disrupt like a startup company.

We are driving to be both a product company and a mobility company. Our vision is nothing less than to change the way the world moves.

At Ford, we view this as the ultimate opportunity. In fact, it is as big of an opportunity as when our founder put the world on wheels more than a century ago. Henry Ford believed that a good business makes excellent products and earns a healthy return. But he proved that a great business does all that while creating a better world.

That is what continues to drive us each day.

Our Blueprint for Sustainability, which focuses on our products and global environmental footprint, brings to life our pledge to build a strong business, deliver great products and create a better world – and to make this pledge relevant in a future that will be very different from the past.”



**William Clay Ford, Jr.**  
Executive Chairman



**Mark Fields**  
President and Chief Executive Officer

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# Letter from Kim Pittel

“ I became vice president, Sustainability, Environment and Safety Engineering in January 2015. During my 30 years with Ford, I have worked in Manufacturing, Product Development, Quality and Purchasing.

I know our key processes and understand what sustainability means in practice to different functions in the company, whether it's incorporating innovative fuel-saving technologies into our vehicles, installing the latest water-saving systems in manufacturing facilities or training our Purchasing teams to spot potential human rights concerns in supplier factories.

Ford has made tremendous strides in sustainability through the years, and I intend to build on those successes. The challenges and opportunities we face as a company, and as a society, are vast. Effectively managing the use of water and transitioning to low-carbon energy sources are increasingly important to developed and emerging economies alike. We must do our part to address these challenges. By collaborating with governments, communities, other automakers and our supply base, we are leveraging partnerships to make more progress, faster.

My priorities – vehicle safety, fuel economy and CO<sub>2</sub> emissions – are no different from those who held this position before me. I also am pushing us to develop better solutions to the use of land, energy and water resources. Of course, the economic sustainability of this company is itself a priority and an integral part of sustainability. We must ensure that Ford is around for the next 100 years.

*Maintaining a zero-defect mindset leads to improved quality, reduced emissions and optimized use of critical resources.*

I bring a somewhat unique perspective to this effort – what I call a zero-defect mindset. When I worked in the Quality function, for example, everyone knew that the goal was zero defects. If you don't set zero as your target, you'll never approach it. I'm a firm believer in setting aspirational goals and working to get there over time. I have brought that same perspective to the Sustainability function. Maintaining a zero-defect mindset leads to improved quality, reduced emissions and optimized use of critical resources. In short, it results in a more sustainable business.

I also want to deepen our integrated sustainability approach by engaging our entire workforce of 187,000 people and reaching the heart of every employee. All of our people should know that they're a part of sustainability, no matter what job they do each day. We have pockets of excellence, but we have more work to do to leverage all employees and



**Kim Pittel**  
Vice President,  
Sustainability, Environment  
and Safety Engineering

have everyone understand how they contribute toward a more sustainable Ford. This transformation won't happen overnight. Over the course of a few years, everyone will know their roles, and we'll have the processes and plans in place to deliver on our sustainability commitment.

Engaging employees in sustainability also responds to a key challenge our industry is facing – the global shortage of talented students entering science, technology, engineering and mathematics (STEM) fields. Young people are looking for a sense of purpose in their work, and an organization in which sustainability is the job of all employees – not just a few – can offer that purpose. Developing talent and building a workforce engaged in sustainability are key components of our future success and of our value proposition as an employer.

At Ford, contributing to a better world is part of our DNA and second nature. I'm excited to be driving our sustainability agenda forward to Go Further – The Right Way.



**Kim Pittel**

Vice President, Sustainability, Environment and Safety Engineering

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## Map of Our Year

The graphic below highlights some of the key events for Ford during 2014.

Explore our highlights:

↓ Jan 2014 ↓ Feb ↓ Mar ↓ Apr ↓ May ↓ Jun ↓ Jul ↓ Aug ↓ Sep ↓ Oct ↓ Nov ↓ Dec ↓ Jan 2015

# January 2014

### Financial Results

Announced pre-tax operating profit of \$8.6 billion (excluding special items), among the best in our history.



### New F-150

Unveiled the new 2015 F-150 with an aluminum body that shaved 700 pounds off the weight of the truck.



### Advancing Automated Driving

Launched new automated driving research projects with the Massachusetts Institute of Technology and Stanford University.

# February

### Top Safety Ratings for Focus

The 2014 Ford Focus maintained top marks



### Most Awarded Brand

Earned the most awards of any domestic automaker and any single brand in U.S. *News & World Report's* 2014 Best Cars for the Money. For Ford Edge and Ford Fusion Hybrid, this made three consecutive wins in the two-row midsize sport utility vehicle and hybrid categories, respectively. Ford Fiesta won two awards, earning best value among both subcompact and hatchback cars.



in the federal government's new car safety rating program. Sedan and hatchback models, as well as Focus Electric, all earned a five-star Overall Vehicle Score in the National Highway Traffic Safety Administration's New Car Assessment Program.

### Ford Talent Center

Established a dedicated Ford Talent Center for salaried employees in Dearborn, Michigan. The center allows Ford to provide better interview experiences for potential hires while showcasing our history, products and location in southeast Michigan.

## March

### Profit-Sharing Payments

Paid record profit-sharing payments of approximately \$8,800 per eligible employee to about 47,000 U.S. hourly employees.



### Electric Vehicle Charging Network

Began construction of one of Michigan's largest solar arrays at Ford World Headquarters. Funded by DTE Energy, the project will include a solar-topped carpark to provide employees with covered parking spaces and charging stations for plug-in electric vehicles.

### Volunteering for Children and Families

Enlisted hundreds of Ford employees for a day of community service to support children and families. Ford Motor Company Fund provided \$57,000 in grants to purchase tools and supplies for the volunteer projects on March 13.



### Top Safety Ratings for Explorer

The 2014 Ford Explorer maintained top marks in the federal government's new car safety rating program. Both front-wheel-drive and all-wheel-drive models earned five-star Overall Vehicle Scores in the National Highway Traffic Safety Administration's New Car Assessment Program.

## April



**FORD FLEET**  
Purchase Planner™

### **Building a Smarter and Greener Fleet**

Unveiled the Ford Fleet Purchase Planner™, a new tool that helps businesses build a fleet of vehicles with an eye toward cost and environmental concerns.



### **Another Five-Star Safety Rating**

The National Highway Traffic Safety Administration awarded the 2014 Ford Transit Connect Wagon a five-star Overall Vehicle Score in its New Car Assessment Program.

## May

### **Celebrating 10 years of Sustainable Manufacturing**

Celebrated 10 years of sustainable manufacturing at the Dearborn Truck Plant as it prepared to build the all-new 2015 Ford F-150.



### **500,000th EcoBoost® Engine for F-150**

More than 56 million gallons of gasoline have been saved as Ford truck customers are choosing V6 EcoBoost® engines – more than all the fuel savings of electric and plug-in electric vehicles ever sold.

### **Supplier World Excellence Awards**

Recognized 51 global suppliers with World Excellence Awards, including two suppliers for their sustainability performance: Laird Technologies and Maersk Lines.

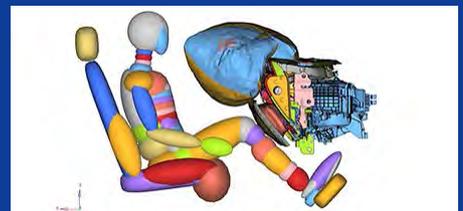


## June



### **You Say Tomato, We Say Tom-Auto**

Announced research collaboration between Ford and H.J. Heinz Company to explore the use of tomato fiber to develop a more sustainable bio-plastic material for vehicles.



### **New Airbag Designs**

Revealed the automotive industry's only five-row side-curtain airbag – the largest in any Ford vehicle – on the 2015 Ford Transit 15-passenger wagon. Also introduced an all-new inflatable airbag restraint design that provides the front seat passenger in a Ford Mustang with knee airbag protection.

## Lightweight Automotive Design

Unveiled our Lightweight Concept vehicle, which uses advanced materials to cut the weight of a Ford Fusion by 25 percent and improve performance and fuel efficiency while reducing carbon dioxide emissions.



## Environmental Volunteerism

More than 500 Ford employees participated in community environmental projects for nonprofit partners as part of a Ford Accelerated Action Day. Ford Motor Company Fund also provided \$46,000 in grants to purchase tools and materials for the June 5 volunteer projects.



## Top Ranking in Best Global Green Brands

Ranked No. 1 on Interbrand's 2014 list of the 50 Best Global Green Brands. Ford claimed the top spot for our forward-thinking approach to environmentally responsible and sustainable manufacturing, greater transparency about business operations, and disclosure of information, particularly in the area of manufacturing.

# July



## New CEO

Mark Fields succeeded Alan Mulally as president and CEO.

## Product Acceleration in Middle East & Africa

Announced an aggressive product acceleration in our newest business unit, Middle East & Africa. Pledged to launch at least 25 new vehicles by 2016 to Middle East & Africa and confirmed that several additional vehicles from our global portfolio will come to the region in the near term – including the iconic Ford Mustang.



## \$1 Million Donation

Announced we will donate \$1 million to the Smithsonian National Museum of African American History and Culture. The donation from Ford Motor Company Fund, the company's philanthropic arm, will support the museum's capital campaign.

# August

## Global LED Lighting Program

Began installation of LED lighting at the

Dearborn Truck Plant as part of our program to invest more than \$25 million in energy efficient LED lighting at manufacturing facilities across the globe. The new lighting is estimated to cut energy consumption by 70 percent compared to traditional technologies.

### Michigan's Largest Solar Array

Launched a solar array project, funded by DTE Energy, that will provide employees with 360 covered parking spaces and 30 charging stations for plug-in electric vehicles such as the Ford Fusion Energi and C-MAX Hybrid Energi.



### 2015 Ford Mustang Begins Production

The all-new Ford Mustang rolled off the line at Flat Rock Assembly Plant, marking the start of production of the sixth-generation pony car. For the first time in its 50-year history, Mustang will be available globally to customers in more than 120 countries around the world.



## September



### Zero Waste-to-Landfill Manufacturing in Canada

Achieved zero waste-to-landfill status at the Oakville Assembly Plant, giving Ford the distinction of becoming landfill-free in all manufacturing facilities in Canada.

### Ninth Annual Global Week of Caring

More than 13,000 Ford employees, retirees and dealers worked on 310 community service projects in 26 countries for the ninth annual Ford Global Week of Caring.



### UAW Job Commitment

Fulfilled our commitment to the UAW to create 12,000 U.S. hourly jobs by 2015, announcing 1,200 new jobs and a second shift at Kansas City Assembly Plant, where the all-new Ford Transit is built. In total, Ford has created 14,000-plus hourly jobs in the United States since 2011.



## October

### New STEM Scholarship Program

Launched the Ford Blue Oval STEM Scholarship Program, which will provide \$500,000 in scholarships over four years to



### **Expanding Our Commitment to Education**

Announced more than \$1 million in new scholarships, grants and career outreach programs launched by the Ford Fund, on top of the approximately \$8 million we invest in education each year.

### **Expanding Vehicle Safety and Driver Assistance Technologies**

Announced Pre-Collision Assist with Pedestrian Detection, a technology that provides a collision warning to the driver and, if the driver does not respond in time, can automatically apply the vehicle brakes. The new system will debut on the 2015 Ford Mondeo in Europe.

50 students pursuing qualifying STEM (science, technology, engineering and math) degrees.



### **30th Anniversary of High School Science and Technology Program**

Celebrated more than 10,000 participants completing the Ford High School Science and Technology Program to date. Some of these participants continued on in Ford's internship program and are now Ford employees.

## *November*

### **Clean Energy Pilot Program**

Announced a pilot program to install wind sail and solar panel systems at four Ford dealerships in collaboration with Wind Energy.

### **Partnership for a Cleaner Environment**

Launched a new environmental supply chain sustainability initiative – the Partnership for A Cleaner Environment (PACE) – to reduce the collective environmental footprint of Ford and our automotive supply chain.



### **Customer Interest for F-150 at Record Levels**

Started production of the 2015 Ford F-150 at the Ford Rouge Center, which was transformed with the latest in manufacturing technology to build the first mass-produced truck in its class featuring a high-strength, military-grade, aluminum-alloy body and bed.

## *December*

### **Chief Data and Analytics Officer**

Appointed Ford Motor Company's first chief data and analytics officer – the first of the

### **Glassdoor Employees' Choice Award**

Received a Glassdoor Employees' Choice

major automakers to do so.



### Fighting Hunger

Hundreds of Ford employees volunteered to feed those in need in their local communities. The Ford Motor Company Fund provided more than \$91,000 in grants to purchase supplies for the day's projects, building on \$1.3 million in financial support, grants, vehicles and other assistance Ford and Ford Fund donated for hunger relief earlier in the fall.

### Employment Growth

Employed approximately 187,000 individuals globally at the end of the year – 6,000 more than at the end of 2013.

## January 2015



### Ford Smart Mobility

Announced a series of experiments that will help us address mobility needs. Ford Smart Mobility is our plan to use innovation to take Ford to the next level in connectivity, mobility, autonomous vehicles and big data.

### New Silicon Valley Research Center

Invested in a new facility in Palo Alto, California, to further supplement our technical and geographic diversity as we focus on innovation and competition in mobility.

Award for Best Places to Work for 2015, based on feedback from employees. Ford was ranked 35th of the top 50 companies by Glassdoor and was the highest-ranking automotive company in the large company category to receive this honor.

### SEC Conflict Minerals Reporting

Successfully filed our first conflict minerals report in compliance with the reporting requirements of the U.S. Securities and Exchange Commission (SEC).



### Record Year in China

Achieved record market share in Asia Pacific and sold more than 1 million vehicles in China for the first time.

### Profits

Reported 2014 full-year pre-tax profit, excluding special items, of \$6.3 billion – the company's fifth consecutive year of both profitability and positive Automotive operating-related cash flow.



### Innovation in Aerodynamics, EcoBoost® and Lightweighting

Unveiled the all-new GT, an ultra-high-performance supercar that serves as a technology showcase for top EcoBoost® performance, aerodynamics and lightweight carbon fiber construction.



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# Performance Summary

Below is a summary of our key performance data.

Please also see [About This Report](#) for discussion of data parameters as well as the pages containing [Financial Health Data](#), [Product Quality and Safety Data](#), [Climate Change and the Environment Data](#), [People Data](#), [Supply Chain Data](#), and [Communities Data](#) for additional indicators, five-year trends and notes on data assurance.

On this page:

- ↓ [Financial Health](#)
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## FINANCIAL HEALTH

	2012	2013	2014
Pre-tax profits (excluding special items), \$ billion	7.9	8.6	<b>6.3</b>

## PRODUCT QUALITY AND SAFETY

	2012	2013	2014
Global Quality Research System "things gone wrong" (3 months in service), total "things gone wrong" per 1,000 vehicles <sup>1</sup>			
North America	1,514	1,650	<b>1,392</b>
South America	1,416	1,724	<b>1,472</b>
Europe	1,573	1,302	<b>1,302</b>
Asia Pacific	860	941	<b>917</b>
Middle East & Africa	1,535	1,311	<b>1,046</b>
Global Quality Research System customer satisfaction (3 months in service), percent satisfied <sup>1</sup>			
North America	79	78	<b>79</b>
South America	65	65	<b>68</b>
Europe	68	71	<b>73</b>
Asia Pacific	67	68	<b>69</b>
Middle East & Africa	69	63	<b>62</b>
U.S. safety recalls, number per calendar year (including legacy vehicles on the road for 10+ years)	24	16	<b>40</b> <sup>2</sup>
U.S. units recalled, number of units (including legacy vehicles on the road for 10+ years)	1,399,000	1,188,000	<b>4,866,770</b> <sup>2</sup>

	2013	2014	2015
Percent of Ford nameplates achieving five-star U.S. New Car Assessment Program (NCAP) Overall Vehicle Score (OVS) (percent of Ford Motor Company)	32	41	<b>65</b>

vehicles tested by model year)

 CLIMATE CHANGE AND THE ENVIRONMENT			
	2012	2013	2014
Ford U.S. fleet fuel economy, combined car and truck, miles per gallon (higher mpg reflects improvement)	30.0	29.5	30.1 <sup>3</sup>
Ford U.S. fleet CO <sub>2</sub> emissions, combined car and truck, grams per mile (lower grams per mile reflects improvement)	297	302	297
Ford Europe CO <sub>2</sub> tailpipe emissions per passenger vehicle, grams per kilometer (phase-in of percent best-CO <sub>2</sub> -performing vehicles; based on production data for European markets)	116 <sup>4</sup>	111.5 <sup>5</sup>	113.9 <sup>6</sup>
Worldwide facility energy consumption, billion kilowatt hours	14.3	15.2 <sup>7</sup>	14.9
Worldwide facility energy consumption per vehicle, kilowatt hours per vehicle	2,539	2,466 <sup>7</sup>	2,470 <sup>8</sup>
Worldwide facility CO <sub>2</sub> emissions, million metric tons	4.8	4.8	4.6
Worldwide facility CO <sub>2</sub> emissions per vehicle, metric tons	0.86	0.78	0.76
Energy Efficiency Index, percent (higher percentage reflects improvement) <sup>9</sup>	6.4	17.0	21.0
Global water use, million cubic meters	23.7	24.9	24.1
Global water use per vehicle produced, cubic meters	4.23	4.04	3.99

 OUR PEOPLE			
	2012	2013	2014
Lost-time case rate by region (per 100 employees; cases with one or more days away from work per 200,000 hours) <sup>10</sup>			
North America			0.75
South America			0.23
Europe			0.33
Asia Pacific			0.03
Middle East & Africa			0.04
Employee satisfaction, Pulse survey, overall, percent satisfied	71	75	76
Overall dealer attitude, Ford, relative ranking on a scale of 1-100 percent (winter/summer score)	84/83	84/85	85/85
Overall dealer attitude, Lincoln, relative ranking on a scale of 1-100 percent (winter/summer score)	68/67	76/78	77/77

 SUPPLY CHAIN			
	2012	2013	2014
Total supplier sites trained/retrained in sustainability management (cumulative, since 2005)	2,437	2,670	2,948
Assessments to date	811	915	990
Training cascade to workforce, individuals trained	430,257	488,472	559,755

 COMMUNITIES			
	2012	2013	2014
Ford Motor Company Fund contributions, \$ million	21.6	26.3	30.2
Corporate contributions, \$ million	8.5	11.4	15.4

1. We no longer report overall quality data for all global regions combined. Quality performance is dependent on regional operations. Therefore we will only report regional quality data moving forward. "Things gone wrong" and customer satisfaction data are based on model years.
2. The increase in safety recalls from 2013 to 2014 was due in part to the U.S. National Highway Traffic Safety Administration (NHTSA) expanding its definition of safety defects, which has led to the highest number of safety recalls in the U.S. across all auto manufacturers.
3. In 2014, the average fuel economy of our U.S. car fleet and U.S. truck fleet both remained unchanged compared to 2013. However, our combined corporate average fuel economy improved by about 2 percent due to increased customer demand for cars versus trucks. Our combined fleet CO<sub>2</sub> emissions improved by 9 percent compared to 2009.
4. Only 65 percent of the best-CO<sub>2</sub>-performing fleet vehicles are accounted for in the 2012 "phase-in" data as part of the European Commission's (EC) phase-in plan.
5. For 2013, final official data from the EC was published October 2014 for passenger cars (vehicle category M1). Only 80 percent of the best-CO<sub>2</sub>-performing fleet vehicles are accounted for in 2013 "phase-in" data as part of the EC's phase in plan.
6. 2014 values are preliminary data published by the EC. Official data will be published by the EC in the fourth quarter of 2015. For more information, see the [data performance page](#).
7. Energy data for 2013 has been restated to include Ford's Hermosillo Stamping and Assembly Plant, which was inadvertently excluded from the calculation in our prior year's report.
8. Total energy use per vehicle deteriorated slightly in 2014 compared to 2013 (it increased by 0.2 percent) due to production changes, an increased number of operating facilities and colder weather, which increases the related energy demands.
9. The Energy Efficiency Index is a normalized indicator of energy used in our manufacturing facilities per vehicle produced based on a calculation that adjusts for typical variances in weather and vehicle production. The Index is set at 100 for the baseline year to simplify tracking annual improvements. The year 2012 improvement indexed against the year 2011 baseline was 6.4, indicating a 6.4 percent improvement in global energy efficiency per vehicle from 2011 to 2012. Higher percentage reflects improvement. The year 2014 improvement indexed against the year 2011 baseline was 21, indicating a 21 percent improvement.
10. 2014 is the first year that we have reported the lost-time case rate broken down by region. Previously, this data was reported as an overall global total.

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# Goals and Progress

This table summarizes Ford’s goals, commitments, targets and progress in our material issue areas<sup>1</sup> and other important performance areas. Please see the data sections for our complete data reporting and data notes.

On this page:

- ↓ [Mobility](#)
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Key:

-  Achieved
-  On track
-  In process
-  Not on track

## MOBILITY

Goal/Commitment	2014 Progress	Status
Set new goals under “Blueprint for Mobility” in early 2012.	Kicked off a series of mobility experiments as part of Ford Smart Mobility, our plan to deliver our vision for meeting mobility needs.	
	Also see: <a href="#">&gt; Mobility</a>	

## PRODUCT QUALITY AND SAFETY

Goal/Commitment	2014 Progress	Status
Design and manufacture vehicles with safety excellence focused on real world safety and offer innovative safety and driver assist technologies.	For the 2015 model year, earned the highest possible Overall Vehicle Score of five stars in the New Car Assessment Program (NCAP) of the U.S. National Highway Traffic Safety Administration (NHSTA) for 15 Ford Motor Company vehicles.  In the 2014 Euro NCAP assessments, earned a five-star safety rating for the Ford Mondeo.  Launched the new Pre-Collision Assist with Pedestrian Protection feature on the 2015 model year Mondeo.	
	Also see: <a href="#">&gt; Accident Avoidance and Driver Assist Technologies</a>	

Meet or exceed all regulatory requirements for safety.	Continued to meet this goal in 2014. Ford’s internal Safety Design Guidelines and other internal standards go beyond stringent regulatory requirements. Ford often establishes internal	
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standards on emerging issues long before public domain or regulatory standards are adopted.

Also see:

> [Vehicle Safety](#)

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Provide information, educational programs and advanced technologies to assist in promoting safe driving practices.

Continued to invest in Ford Driving Skills for Life (DSFL). Since launching the program in Europe in 2013, we've provided free, hands-on training to 6,100 young drivers in Belgium, France, Germany, Italy, Romania, Russia, Spain and the U.K. through more than 130 events. In the U.S., Ford DSFL focuses on teen drivers through five signature programs. In 2014 the Ford DSFL U.S. National Tour reached out to more teens, parents and educators than ever before and included nearly 40 days of hands-on training. In our Asia Pacific markets, Ford DSFL is aimed at novice drivers of all ages. Approximately 15,000 drivers in this region were trained in 2014. In the Middle East and Africa, we launched the program in 2012 in Dubai and the United Arab Emirates and expanded it to Saudi Arabia in 2014.



On the technology side, MyKey, Ford's innovative technology designed to help parents encourage their teenagers to drive more safely, is now in more than 9 million Ford and Lincoln vehicles on the road in the U.S. and is available on nearly all Ford Motor Company retail vehicles in North America.

Also see:

> [Encouraging Safer Driving](#)

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Play a leadership role in vehicle safety and driver assist research and innovation.

In December 2013, unveiled a Ford Fusion Hybrid automated research vehicle that is enabling us to further test current and future sensing systems and driver assist technologies.



Continued to collaborate with other automotive companies on precompetitive safety projects to enhance the safety of the driving experience and develop future technologies, such as through the U.S. Council for Automotive Research.

And, continued to collaborate with university partners on a wide range of research projects, including research into advanced safety technologies. In 2014, awarded 31 new University Research Program grants to 21 universities around the globe.

Also see:

> [Accident Avoidance and Driver Assist Technologies – Collaborative Research](#)

> [Occupant Protection Technologies – Collaborative Research](#)

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Play a leadership role in research relating to “connected vehicles.”

Continued to participate in several multi-stakeholder research projects relating to connected vehicles, including the Crash Avoidance Metrics Partnership and the Vehicle Infrastructure Integration Consortium in the U.S., and DRIVE C2X and Adaptive



in Europe.

Also see:

- > [Accident Avoidance and Driver Assist Technologies – Collaborative Research](#)

## CLIMATE CHANGE AND THE ENVIRONMENT

Goal/Commitment	2014 Progress	Status
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### Climate Change – Products

Do our share to stabilize carbon dioxide (CO <sub>2</sub> ) concentrations in the atmosphere at 450 ppm, the level generally accepted as that which avoids the most serious effects of climate change.	Increased our U.S. combined car and truck fleet-average fuel economy by 2 percent in 2014, compared with 2013. <sup>2</sup>	
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Reduced the average CO<sub>2</sub> emissions of our European car fleet by approximately 18 percent from the 2006 to 2014 calendar years.

Also see:

-  [Vehicle Fuel Economy and CO<sub>2</sub> Emissions](#)
- > [Climate Change](#)
- > [Vehicle Fuel Efficiency and CO<sub>2</sub> Emissions Progress and Performance](#)

For each of our new or significantly refreshed vehicles, we offer a powertrain with leading fuel economy.	Followed through on this commitment with vehicles introduced in all our regions.	
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Also see:

- > [Vehicle Fuel Efficiency and CO<sub>2</sub> Emissions Progress and Performance](#)

### Climate Change – Manufacturing

Reduce global facility CO <sub>2</sub> emissions per vehicle by 30 percent by 2025 compared to a 2010 baseline.	Reduced CO <sub>2</sub> emissions by 2.4 percent per vehicle produced compared to 2013.	
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Also see:

-  [Worldwide Facility CO<sub>2</sub> Emissions per Vehicle](#)
- > [Operational Energy Use and Greenhouse Gas Emissions](#)

Reduce facility energy use per vehicle globally by 25 percent between 2011 and 2016, adjusted for weather and production.	Energy use per vehicle deteriorated slightly (it increased by 0.2 percent) compared to 2013 due to production changes, an increased number of operating facilities, and colder weather, which increases the related energy demands.	
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Also see:

-  [Worldwide Facility CO<sub>2</sub> Emissions per Vehicle](#)
- > [Operational Energy Use and Greenhouse Gas Emissions](#)

### Environment – Products

Increase the use of recycled, renewable and lightweight materials.	Since 2011, all vehicles produced in North America have soy foam seating.	
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Use soy foam seat cushions and backs on 100 percent of Ford vehicles manufactured in North America.	Since 2012, all new and redesigned vehicles launched in North America meet our goal to use at least 25 percent recycled content seat fabrics.	
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Use at least 25 percent recycled content in seat

fabrics on all new and redesigned vehicles sold in North America.

Continued to develop sustainable materials strategy requiring recycled plastics and textile materials for many applications globally. Continued to implement strategic principles for expanding the use of recycled and renewable materials that seek to reduce total life cycle impacts.

Also see:

> [Choosing More Sustainable Materials](#)

Increase the use of allergy-tested and air-quality-friendly interior materials.

Continued to implement specification for low-emissions and allergy-free materials, which is being migrated across product lines. 

Also see:

> [Improving Vehicle Interior Environmental Quality](#)

### Environment – Manufacturing

Reduce CO<sub>2</sub> emissions.

(See [Climate Change](#) section of Goals table.)

Cut the amount of water used to make each vehicle by 30 percent globally by 2015, compared to 2009.

Achieved this goal two years ahead of schedule. We were in the process of updating our global manufacturing water strategy in 2015 and setting a new long-term target. From 2013 to 2014 we reduced our absolute water use by 3 percent and our water use per vehicle produced by 1.25 percent. 

Also see:

 [Water](#)

> [Water Use in Our Operations](#)

Reduce waste sent to landfill by 40 percent on a per-vehicle basis between 2011 and 2016 globally.

Reduced waste to landfill per vehicle produced by 19 percent compared to 2013. 

Also see:

 [Waste to Landfill per Vehicle](#)

> [Waste Management](#)

Maintain volatile organic compound (VOC) emissions from painting at North American assembly plants at 23 grams/square meter or less.

Achieved 2014 VOC emissions at North American assembly plants of 16.8 grams/square meter. 

Also see:

 [North America Volatile Organic Compounds Released by Assembly Facilities](#)

> [Non-CO<sub>2</sub> Facility Emissions](#)

## OUR PEOPLE

Goal/Commitment

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### Safety

Fatalities target is always zero.

In 2014, for the fourth time in Ford's history, did not have an employee work-related fatality during the calendar year. Tragically, however, we did experience four fatalities of contractors – in Kansas City, Argentina, Brazil and China. 

Also see:

 [Workplace Safety](#)

Serious injuries target is zero; overall goal is to attain industry competitive lost-time and drive continuous improvement; specific targets are set by business units yearly for five years into the future.

Overall, our safety record improved compared to 2013. A major safety indicator – the lost-time case rate – was at 0.38, a 14 percent improvement from the 2013 rate of 0.44.



Also see:

[Workplace Safety](#)

> [Health and Safety](#)

**Health**

Maintain or improve employee personal health status through participation in health risk appraisal and health promotion programs.

Had active personal health promotion programs in place in most regions. Our efforts are tailored to meet local health priorities and to ensure that our people receive quality health care when they need it. Employee participation in health-risk appraisals is a core component of U.S. health benefit program. In 2014, more than 80 percent of salaried employees and retirees met the objectives of this program and increased their awareness of personal health improvement opportunities.



Also see:

> [Health as a Strategic Advantage](#)

**SUPPLY CHAIN**

Goal/Commitment	2014 Progress	Status
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**Human Rights and Working Conditions**

Encourage key production suppliers to: introduce codes of conduct aligned with international standards and Ford's Policy Letter 24: Code of Human Rights, Basic Working Conditions and Corporate Responsibility; develop the associated robust management and compliance systems; and extend these expectations to their own suppliers.

95 percent of Production Aligned Business Framework (ABF) suppliers have an aligned code of conduct; 60 percent meet all expectations.



Also see:

> [Going Further Actions](#)

Help suppliers build their capacity to manage supply chain sustainability issues through site-level training on human rights, working conditions and ethical business practices; require participating suppliers to cascade training information to their own employees and suppliers.

Conducted supplier sustainability training sessions in six countries with 280 suppliers in attendance.



Also raised awareness of supply chain sustainability internally through training of new purchasing personnel and global supplier technical assistance staff.

Also see:

[Working Conditions Training and Assessment Status for Supply Chain](#)

> [Supplier Training and Education](#)

> [Industry Collaboration](#)

Assess Tier 1 suppliers for compliance with local laws and Ford's supply chain sustainability expectations.

Conducted assessments at 75 supplier sites, with corrective action plans and remediation underway.



Also see:

[Working Conditions Training and Assessment Status for Supply Chain](#)

> [Assessing Suppliers](#)

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## Environmental Management

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Engage with our supply chain to understand its carbon and water footprints.

Surveyed approximately 250 suppliers through the CDP Supply Chain questionnaires for water and climate change and achieved an 80 percent voluntary response rate. 

Also see:

> [Assessing the Environmental Impacts of Our Suppliers](#)

Work with selected suppliers to reduce our collective environmental footprint by encouraging target setting and sharing best practices for energy and water use reductions.

Began pilot of a new environmental initiative called the Partnership for a Cleaner Environment (PACE) with 10 selected suppliers, whereby we are sharing best practices for energy, greenhouse gas emissions and water use reductions. 

Also see:

> [Building Supplier Capability](#)  
> [Collaborating with Industry Partners](#)

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## Conflict Minerals

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Improve the transparency of mineral sourcing within our supply chain while improving the capacity of conflict-free smelters.

Received a conflict minerals report from 91 percent of our in-scope suppliers. 

Obtained lists of smelters from 41 percent of our in-scope suppliers.

Led smelter outreach efforts resulting in 70 percent of smelters being active or compliant in the Conflict-Free Sourcing Initiative (CFSI) audit program.

Also see:

> [Conflict Minerals in Our Supply Chain](#)

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## Supplier Diversity

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Source at least 10 percent of U.S. purchases from minority- and women-owned businesses annually.

Purchased \$6.75 billion in goods and services, or 13.3 percent of our total global spend, from approximately 200 minority-owned suppliers, and \$2.1 billion, or 3.4 percent of our global spend, from more than 150 women-owned businesses. This was the fifth consecutive year of improvement and exceeded our sourcing goals for both minority- and women-owned suppliers. 

Also see:

 [Employee Engagement and Diversity](#)  
> [Supplier Diversity](#)

- 
1. For financial health related goals, please see the [10-K](#) (pdf, 6.5Mb) for information on our 2015 full year outlook.
  2. The average fuel economy of our car fleet and our truck fleet both remained unchanged compared to 2013. However, our combined corporate average fuel economy improved due to increased customer demand for cars versus trucks.

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# Ford Around the World

Around the world, we are seeking to improve the way the world moves through innovation and efforts to improve mobility. In all of our regions, we are taking actions to reduce the environmental impact of our products and facilities, support positive social change and ensure economic viability for long-term growth. All of these actions reflect our commitment to deliver profitable growth for all, while building a better world.

We organize our business in five regional operating units: Asia Pacific, Europe, Middle East and Africa, North America, and South America.

## Asia Pacific

Of all our regions, Asia Pacific has the fastest-growing automotive market. We are expanding our regional operations to meet this growing demand. In 2014, we launched eight new vehicles in the region and delivered record profits of \$589 million. We have also built 10 new plants in Asia Pacific, including new vehicle assembly plants in China and India that were inaugurated in March 2015. As we continue our growth in the region, we are committed to going further the right way. We are not only building great products and a strong business; we are also working to build a better world. This commitment is reflected in part by the fuel-efficient products we are launching and the state-of-the-art, environmentally friendly technologies we are implementing in our new plants in the region.



> [Read more about our operations in the Asia Pacific region](#)

## Europe

We have a long history of operations in Europe; the first Ford cars were shipped to Europe in 1903 – the same year Ford Motor Company was founded. Today, we sell Ford vehicles in 50 individual markets in Europe and employ approximately 53,000 people at our wholly owned facilities in the region. As we continue to implement our European transformation plan, sustainability underpins our efforts to grow our business and deliver profitable growth for all. For example, we now have 92 models and variants in Europe with carbon dioxide (CO<sub>2</sub>) emissions below 130 g/km. By launching exciting vehicles with advanced fuel efficiency and safety technologies, implementing environmentally efficient and cost-efficient manufacturing strategies, and continuing to invest in our employees and communities, we are ensuring our long-term business success in Europe.



> [Read more about our operations in Europe](#)

## Middle East and Africa

Established in 2014, Middle East and Africa is our newest business unit, but we have been selling vehicles in the region for 90 years. This region includes 67 markets in North Africa, Sub-Saharan Africa, Southern Africa and the Middle East. Many of these are fast-growth automotive markets; the total Middle East and Africa car market is expected to grow 40 percent by the end of the decade. To meet new customer demand, by 2016 we will launch 25 vehicles in the region that will offer the very best quality, fuel efficiency, safety, smart design and value, including vehicles with fuel-efficient EcoBoost® engines, SYNC® in-car connectivity, and vehicle safety technologies such as inflatable rear seat belts. As we grow Ford's business in this region, we are staying true to our principles of being active and supportive members of the communities and the future of the Middle East and Africa region.



[> Read more about our operations in the Middle East and Africa region](#)

## South America

Ford's principal markets in South America include Brazil, Argentina and Venezuela. We employ 16,000 people and have eight manufacturing plants in the region. As we continue to implement the ONE Ford plan in South America, we are investing in a strong future for the region built on great products, a strong business and a better world. We are launching new products that offer advanced fuel-efficient technologies. For example, in 2014 we launched the all-new Ford Ka, which leads the compact and medium categories for fuel efficiency in Brazil. We also offer a hybrid electric Ford Fusion in Brazil, which is the most fuel-efficient vehicle in this market. We are also continuing to invest in our people and communities. In 2014, for example, we opened a new engine plant in Brazil, which will create 300 new direct jobs. We also continued to expand our employee health programs and increase our investments in education in local communities.



[> Read more about our operations in South America](#)

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# Ford of Europe

Ford of Europe is responsible for producing, selling and servicing Ford-brand vehicles in 50 individual markets and employs approximately 53,000 employees at its wholly owned facilities, or approximately 67,000 people when joint ventures and unconsolidated businesses are included.

Ford of Europe operations include a Ford Customer Service Division and 23 manufacturing facilities (15 wholly owned or consolidated joint venture facilities and eight unconsolidated joint venture facilities), as well as Ford Motor Credit Company. The first Ford cars were shipped to Europe in 1903 – the same year Ford Motor Company was founded. European production started in 1911.

## Performance Highlights

- In 2014, Ford posted its highest full-year market share in Europe since 2011.
- At the end of 2014, we launched the all-new Ford Mondeo in Europe. This vehicle delivers the power of choice for customers with 14 powertrain combinations, the broadest-ever Mondeo lineup. The lineup includes Ford's first gasoline hybrid electric vehicle available in Europe; three very-low carbon dioxide (CO<sub>2</sub>) emission EConetic versions; and a version with the multiple-award-winning 1.0L EcoBoost<sup>®</sup> petrol engine.
- The Ford Mondeo was awarded the maximum five-star safety rating by independent crash test authority Euro NCAP in 2014. The Mondeo is also the first Ford vehicle worldwide to offer Pre-Collision Assist with Pedestrian Detection, a technology designed to detect people on the road ahead and automatically apply the brakes if the driver does not respond to warnings.
- The Ford Fiesta was the number one bestselling small car in Europe in 2014, for the third year in a row. The Fiesta features new smart technologies and seven powertrain options (both diesel and petrol) that deliver fuel economy with less than 100 grams of CO<sub>2</sub> per kilometer.
- Ford became the top-selling commercial vehicle brand in Europe in the first quarter of 2015.
- Also in 2015, we are completing the final part of a €2.3 billion investment – the largest ever in Spain's auto industry – in our Valencia, Spain, manufacturing operations, transforming it into one of the world's most advanced, flexible and productive auto plants. Ford now employs about 8,000 people at the facility, up from just below 5,000 in early 2013. Supplier operations supporting the Valencia plant's production also have added 1,500 jobs since 2013.

*Ford of Europe operations include 23 manufacturing facilities.*

## Awards

- Ford's 1.0L EcoBoost engine was named 2014 International Engine of the Year by a panel of automotive journalists for an unprecedented third year running. In 2014, one out of five Ford vehicles sold in Europe was equipped with 1.0L EcoBoost. The engine is produced in Cologne, Germany; Craiova, Romania; and Chongqing, China, and is now available in 72 countries worldwide.
- The all-new Ford Mondeo received the maximum five-star safety rating from Euro NCAP. As noted above, it is also the first Ford vehicle in the world to offer Pre-Collision Assist with Pedestrian Detection, which can automatically apply the brakes if people are detected in the road ahead, and it is the first vehicle in its segment to offer inflatable rear safety belts.
- Ford's Driving Skills for Life (Ford DSFL) program, created to encourage responsible driving in motorists ages 18 to 24, was recognized with the Volante Sicuro 2014 award, a prize created by Videomotori with the participation of Michelin. The Ford DSFL program will be offered in 11 countries in 2015, with training taking place for the first time in Denmark, the Netherlands and Turkey.
- Ford was named Most Innovative Volume Brand 2015 at the AutomotiveINNOVATIONS Awards.

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Ford of Europe

# Welcome

“ In Europe, we are focused on creating an exciting and vibrant Ford business through an unprecedented focus on great products, a strong brand and increased cost efficiency. Sustainability is at the very heart of this effort.

This year is one of the busiest ever for new vehicle launches in Europe, which gives us the opportunity to provide sustainable transportation to more customers than ever. For example, we are launching new Ford vehicles with advanced fuel efficient technologies and alternative powertrains. At the same time, we added two additional EcoBoost engine variants in 2014, and expanded the total number of EcoBoost engine configurations in Europe to 15.

Importantly, we introduced our first hybrid electric vehicle in late 2014 – the Ford Mondeo Hybrid – which joined the Ford Focus Electric battery electric vehicle and the C-MAX Energi plug-in hybrid to form our European electrified vehicle line-up. Overall, we now have more than 90 models and variants in Europe with carbon dioxide (CO<sub>2</sub>) emissions below 130 g/km, and more than 20 that offer CO<sub>2</sub> emissions below 100 g/km.

*“As we work every day to create an exciting and vibrant Ford of Europe, sustainability underpins everything we do.”*

We also are continuing to improve the efficiency and sustainability of our manufacturing operations. There are now a total of seven zero-waste-to-landfill Ford plants in Europe, and we are making progress on our goal to cut energy use by 25 percent on a per-vehicle basis by 2016. We are also reducing water usage significantly. In fact, we reached our goal – two years early – to reduce water use per vehicle produced by 30 percent from 2009 to 2015.

Sustainability also means engaging with and investing in our local communities. One way we do this is by giving all Ford of Europe employees two paid work days per year to volunteer in their communities. In Germany alone, a record 1,000 employees contributed at least 16 hours of volunteer time in 2014.

Sustainability is not just the right thing to do: it is a core part of our business strategy. By launching exciting fuel efficient vehicles, implementing environmentally sound and cost-efficient manufacturing strategies, and continuing to invest in our employees and communities, we are contributing to Ford’s long-term business success in Europe.”



**Jim Farley**  
Executive Vice President,  
Ford Motor Company, and  
President, Europe, Middle  
East and Africa

**Jim Farley**  
Executive Vice President, Ford Motor Company, and President, Europe, Middle East and

Africa

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Ford of Europe

# Mobility

Changing times are creating exciting new opportunities for our business. At Ford, we're not just about making vehicles. We're focused on innovative, sustainable solutions for future global mobility. We're leveraging our people, products and supplier partners to deliver mobility solutions.

Our vision is to truly change how the world moves – again. Henry Ford did that a century ago when he manufactured affordable automobiles for the masses, thereby democratizing travel. We believe we have an opportunity to revolutionize transportation once more, only this time we'll be powered by the digital economy. We aim to make the entire transportation experience easier, to improve lives.

## Addressing Congestion and Changing Mindsets

We are focused on protecting the freedom of movement of people and goods – a freedom that is being affected by large societal megatrends such as urbanization and increased traffic congestion. Europe is not immune to the threats posed by increasing congestion and over-stretched infrastructure. To address the risks as well as the opportunities, Ford and society as a whole must change the way we think, collaborate and behave.

By harnessing the power of our people, our products and our supply chain, we are acting on our Blueprint for Mobility – our multi-decade plan for helping to develop better ways to move people and goods and thereby create a better world. In early 2015, we announced Ford Smart Mobility, which is using innovation to take Ford to the next level in connectivity, mobility, autonomous vehicles, big data and the customer experience. As the first step, in 2014 we kicked off mobility experiments around the globe – all designed to test new mobility concepts and evaluate their impact on the environment, while creating value for our business at the same time. We are also hosting a global Innovate Mobility Challenge series, an open-innovation approach to discovering mobility solutions around the world.

We're tying together the promise of connected and autonomous vehicles with a broader transportation network that can make traveling from Point A to Point B easier than ever, whether in crowded cities or remote rural landscapes. We're developing advanced new vehicles and new mobility solutions that, when coupled with other modes of transportation, will change the way the world moves by improving safety, reducing congestion and lowering greenhouse gas emissions.

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*We have an opportunity to revolutionize transportation once more.*

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*Blueprint for Mobility is our multi-decade plan for helping to develop better ways to move people and goods.*

---



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*We want to help make it easier and safer to travel from Point A to Point B, with lower greenhouse gas emissions too.*

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By driving toward unfettered access to mobility, we can enable human progress. We view the disruption that's taking place in mobility as something to embrace – not fear. We want Ford to be part of the solution by redefining what's possible.

## Mobility Experiments Across Europe

Several of our current mobility experiments and innovation challenges are in Europe:

- **Dynamic Social Shuttle, London:** In London, Ford is investigating a service of shareable premium mini-buses that offer point-to-point pick-up and drop-off on-demand. The goal is to better understand the social dynamics and routing requirements of shared transportation. Commuters enter a starting location and a destination into a smartphone app. A shuttle that accommodates four to 10 passengers picks up and drops off commuters at convenient locations, taking the most suitable route for all passengers on board
- **City Driving on Demand, London:** While many car-sharing services exist that are based on the reservation model, the focus of this London-based experiment is on-demand use. Researchers are exploring how to optimize the service, such as offering pay-by-minute and enabling one-way trips across the city. The experiment uses a fleet of Ford Focus Electric vehicles and Ford Fiestas with EcoBoost® powertrains located across London. People can use a mobile app to register for the service, get directions to the nearest service location, reserve a vehicle and pay for the service. The London service targets a better customer experience and improved operational efficiency compared to existing car-sharing models. The experiment also aims to reduce congestion and, by using zero- and low-emissions vehicles, car-generated pollution
- **Ford Carsharing, Germany:** In Germany, Ford Carsharing is the first manufacturer-backed, nationwide car-sharing program incorporating dealerships. The collaboration recently expanded and now has 39 participating dealers in 55 cities with more than 100 locations. Ford is working with Flinkster, a large car-sharing company with multiple partners. Ford Carsharing customers can use any Flinkster vehicle, and Flinkster's 270,000 customers can use the Ford fleet
- **Painless Parking, London:** In London, Ford is working to make parking easier for drivers in the city. Drivers voluntarily use plug-in devices that create live data on traffic and parking. The City Dash app tells users whether they are legally parked. If not, the app recommends the nearest open spot. It allows drivers to pay for parking meters by mobile phone, and identifies the closest available parking spots to the driver's final destination
- **Data Driven Insurance, London:** This experiment studies a driver's behavior over time in order to build a more personalized mobility profile. The goal is to create a driving behavior passport that can be used to calculate more exact insurance rates and allow drivers to take the information with them, from car to car or from insurance carrier to insurance carrier. This kind of data might enable lower insurance rates for good drivers.
- **Traffic Tamer, London:** London's busy streets and limited parking spaces mean drivers have a hard time getting from place to place, and an even harder time finding somewhere to park when they arrive. Ford asked developers to consider how technology could make it easier and more convenient for drivers in London to get where they need to go and find a place to park their car when they do arrive. The winner, the AppyParking smartphone application, consolidates parking areas, restrictions and rules into one map. With a few taps of their finger, drivers can see where meters and lots are located, when parking is restricted, and, in some areas,

even find available parking spaces. Users can also pre-pay for parking with the app

- **City Mobility, Portugal:** On the narrow streets of Lisbon, congestion has worsened with population growth due to the mountains and hills surrounding the city. This is making the task of moving goods and services around ever-more difficult. Ford asked developers to reimagine urban mobility by looking at how technology and data – big data, real-time data, and data integrated into systems – could streamline the process of getting people and goods around efficiently, reducing congestion and saving time and money. The winner, Smartaxi, is a smartphone app that helps taxi drivers respond to demand for cars quickly and efficiently. The app crowd-sources location data from taxi drivers to produce heat maps showing where cabs are needed and where passengers are headed – saving taxi drivers wasted time and fuel looking for fares. By using predictive analysis, Smartaxi can also help direct taxi drivers to locations in the city where demand is likely to increase over the next 24 hours – ensuring that drivers have more fares and customers can find a taxi when they need one
- **Handle on Mobility, Spain:** At the Mobile World Congress in Barcelona, we announced our Handle on Mobility experiment. This experiment will help us understand how electric bicycles can be integrated seamlessly with cars and public transport with the help of a multi-functional smartphone app to deliver faster and easier daily commutes and help businesses operating in urban centers. At the start of this experiment, we challenged our employees around the world to submit designs for electric bicycles, or e-bikes. From more than 100 designs, we developed two easy-to-use, folding e-bikes, each equipped with a 200-watt motor with 9-amp-hour battery and capable of speeds up to 25 km/h (15 mph). The e-bikes include technology inspired by the automotive industry, including brake lights and a horn. When folded, they both fit easily into Ford vehicles, where they can also be charged. The experiment also includes a multi-functional app that helps commuters determine the best route and combination of transport modes (e-bike, car, train, etc.) to reach their destination in the shortest time or for the least cost.

## Research Projects in Europe

We also have several mobility-related research projects in Europe, including the following:

- In 2015, the Ford European Research & Innovation Center in Aachen, Germany, and the Technology and Innovation Management Institute of RWTH Aachen University launched the Personal Mobility Experience Innovation project, a research collaboration driving innovation in mobility and autonomous vehicles to help solve future global transportation challenges. The project aims to identify the features, technologies, services and solutions that could enable Ford to meet customers' changing preferences and expectations for personal mobility and help address societal challenges such as traffic congestion and environmental issues.
- Ford will also contribute to the U.K. government-sponsored U.K. Autodrive initiative, working alongside other manufacturers to study how driverless and connected cars can be integrated into everyday life. Ford will provide two prototype cars with vehicle-to-vehicle communications capability to help test an innovative public transport system. Vehicle-to-vehicle and vehicle-to-infrastructure connectivity technologies such as those tested in real-world urban environments during the U.K. Autodrive initiative also will contribute to the development of fully autonomous vehicles.

### READ MORE:

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*Read more about our efforts to reshape mobility.*

[> Mobility](#)

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Ford of Europe

# Climate Change and Environment

At Ford, we have been working for many years to reduce the environmental impacts of our vehicles and operations.

For example, Ford recognizes the risks and opportunities climate change poses, and we are committed to doing our share to prevent or reduce the potential for environmental, economic and social harm due to climate change. To make good on this commitment, we have analyzed what “doing our share” means according to the science of climate change.

We set emission reduction goals for our products by region and manufacturing operations based on stabilizing the atmospheric concentration of carbon dioxide (CO<sub>2</sub>) at 450 parts per million (ppm), the level that many scientists, businesses and governmental agencies believe may avoid the most serious effects of climate change.<sup>1</sup> We are on track to meet the central elements of our strategy. For each of our new or significantly refreshed vehicles, we offer a powertrain with leading fuel economy, and we are reducing greenhouse gas (GHG) emissions across our global product portfolio. Also, we are on track to meet our goals to reduce our facility CO<sub>2</sub> emissions by 30 percent from 2010 to 2025 on a per-vehicle basis, and our average energy consumed per vehicle by 25 percent from 2011 to 2016 globally.

## Vehicles

Ford offers one of the broadest low-CO<sub>2</sub> vehicle portfolios in Europe. Our efforts to improve fuel efficiency are paying off. We have reduced the average CO<sub>2</sub> emissions of our European car fleet by around 18 percent between the 2006 and 2014 calendar years. In total, Ford offers 92 models and variants in Europe with CO<sub>2</sub> emissions below 130 g/km, of which 21 models or variants have CO<sub>2</sub> emissions below 100 g/km.

## EcoBoost<sup>®</sup> Engines and EConetic Technology

In Europe, we are continuing to expand the use of our EcoBoost engines, which use turbocharging and direct injection along with reduced displacement to deliver significant fuel-efficiency gains and CO<sub>2</sub> reductions, relative to larger displacement engines, without sacrificing vehicle performance. We offer five EcoBoost gasoline engines in Europe – the 2.3L, 2.0L, 1.6L, 1.5L and 1.0L EcoBoost engines – which are available on 15 models of Ford vehicles in Europe: the Ford Fiesta, B-MAX, EcoSport, C-MAX, Grand C-MAX, Focus, Kuga, Mondeo, Mustang, S-MAX, Galaxy, Transit Courier, Tourneo Courier, Transit Connect and Tourneo Connect.

On this page:

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- ↓ Eco-Driving Information and Training
- ↓ Reducing Non-CO<sub>2</sub> Tailpipe Emissions
- ↓ Sustainable Manufacturing

**OUR PERFORMANCE**

Average CO<sub>2</sub> emissions of our European car fleet reduced by

↓ 18%

between 2006 and 2014 calendar years.

In 2015, we introduced a Ford Mondeo with the 1.0L EcoBoost engine, which delivers fuel economy of 5.1 l/100 km (55.4 mpg) and 119 g/km CO<sub>2</sub> emissions.<sup>2</sup> This Mondeo is the first vehicle in its segment with a 1.0L gasoline engine. Approximately one out of five Ford vehicles sold in 2014 was equipped with the multiple-award-winning 1.0L EcoBoost. Also in 2014, the Ford Focus became the first non-hybrid gasoline family car in Europe to break the 100 g/km CO<sub>2</sub> barrier when equipped with the revised 100 PS version of the 1.0L EcoBoost engine.

*We offer EcoBoost engines on 15 models of vehicles in Europe.*

---

We offer six ECONetic vehicles: the Ford Fiesta, Focus, Mondeo, Transit Custom, Transit Connect and, beginning in mid-2015, the new C-MAX. ECONetic vehicles are ultra-low-CO<sub>2</sub> versions of selected Ford diesel vehicles that leverage several advanced, fuel-saving technologies. For example, the Ford Fiesta ECONetic has CO<sub>2</sub> emissions of just 85 g/km and offers fuel economy of 3.3L/100 km. This model includes a range of Ford technology features, including revised gear ratios; a special aeropack to improve aerodynamics (comprising undershield wheel deflectors and low-rolling-resistance tires); a variable oil pump; a more-efficient air conditioner, cooling fan and alternator; as well as friction and combustion improvements in the engine. It also features Auto Start-Stop, smart regenerative charging, EcoMode and a shift indicator light.

---

*Advanced, fuel-saving technologies are enabling ultra-low-CO<sub>2</sub> versions of selected Ford diesel vehicles.*

---

## **Electrification**

In 2015, we launched our first hybrid electric vehicle built and sold by Ford in Europe, the new Ford Mondeo Hybrid. We have also offered the Focus Electric all-electric vehicle in the region since 2013, and we offer the C-MAX Energi plug-in hybrid vehicle in several European markets.

In Germany, Ford is working with 12 other partners on the colognE-mobil project, using a fleet of electrified vehicles – including Focus Electrics and C-MAX Energi plug-in hybrids – to conduct road testing. Since July 2012 the vehicle fleet has covered a distance of half a million kilometers. This program is part of a much larger research effort in several German cities that is partly funded by the German government and involves multiple automakers, utility companies, universities and technology partners. Now in its second phase, the project focuses on charging infrastructure improvements; the use of renewable power, electric car-sharing and e-cabs; networking effectively with public transport; and public perception and safety.

We believe these kinds of collaborative efforts across sectors are essential for ensuring customer-focused products that provide the right value. They also help to ensure that the infrastructure is in place to support these types of vehicles.

## **Alternative Fuels**

We also offer liquefied petroleum gas (LPG, or propane autogas) versions of the Ford Fiesta, B-MAX, Focus and C-MAX in markets where dedicated infrastructure exists, such as Spain, Portugal, Italy, Germany and Turkey. All of our diesel vehicles can run on a fuel blend of up to 7 percent biodiesel (B7). And, we offer a flex-fuel version of the Ford Focus in selected markets that can run on E85 (85 percent ethanol).

## **Eco-Driving Information and Training**

Ford has demonstrated that drivers who practice “eco-driving” can improve their fuel economy by an average of 24 percent. Eco-driving tips are available to the public on Ford’s

website, and online training is available through the [Ford Driving Skills for Life \(Ford DSFL\) program](#).

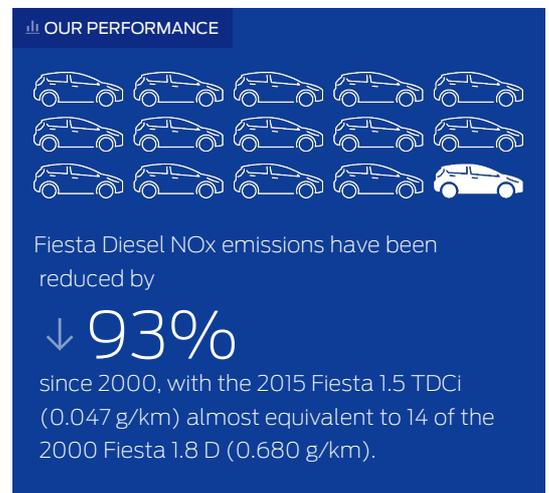
Ford began work on the eco-driving concept in 2000, when we first offered an eco-driving program through our German dealerships, in partnership with the German Federation of Driving Instructor Associations and the German Road Safety Council. That program, which continues today, trains drivers in smarter and greener driving skills and vehicle maintenance habits. It uses specially trained and certified instructors to run programs for several target groups, including fleet drivers and customers. By the end of 2014, more than 18,000 German drivers had been “eco-trained” through this program.

## Reducing Non-CO<sub>2</sub> Tailpipe Emissions

Air quality and the related health risks from congestion are issues we take very seriously. With increasing numbers of vehicles on the road, we need to address air quality with more fuel-efficient vehicles and alternative powertrains. Through the development of a new generation of downsized, high-efficiency gasoline- and diesel-powered vehicles with improved engine technologies and high-tech exhaust gas treatment devices we are achieving massive improvements in non-CO<sub>2</sub> tailpipe emission reduction.

Further improvements have been generated as we have introduced vehicles equipped with technology to meet the more stringent Euro 5, and now Euro 6, emissions standards. Since Euro 1 emissions regulations were introduced in 1992, particulate matter emissions from light-duty diesel vehicles have decreased by 96 percent. Similar improvements have been reached on nitrogen oxides (NO<sub>x</sub>) emissions in passenger cars. For example, the Fiesta Diesel's NO<sub>x</sub> emissions have been reduced by 93 percent since 2000.

All of our new passenger cars registered as of January 1, 2014, and all light-duty vehicles registered as of September 2015, comply with the Euro 5 standards. Phase I of the Euro 6 standards, which will be even more stringent, will be applied in September 2018 for all new registered cars. Today, the Ford Ka, Fiesta, B-MAX, EcoSport, C-MAX, Focus and Mondeo already comply with Euro 6.



## Sustainable Manufacturing

In early 2012, Ford of Europe announced our five-year sustainable manufacturing strategies for water, landfill waste and emissions. The strategies include ambitious targets to produce the average Ford vehicle using 30 percent less water and creating 70 percent less waste to landfill in manufacturing over the next five years. We also set a goal to reduce by 25 percent the amount of energy it takes to manufacture a vehicle, before 2016.

### Water Reduction

We met our water-reduction goal in 2013, two years early. We met this goal by implementing a wide range of water-saving technologies and process improvements across our global operations. In Europe, Ford's engine plants in Cologne, Germany, and Craiova, Romania, where the 1.0L EcoBoost engine is produced, introduced advanced manufacturing techniques that reduce the volume of water coolant required when machining aluminum engine parts to just five milliliters per component, down from two liters. We are now in the process of developing an updated global water manufacturing strategy and new long-term water-reduction goals.

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*We have met our water-reduction goal two years ahead of schedule.*

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## Energy Initiatives

By the end of 2015, we expect to have achieved the planned 25 percent energy savings throughout Europe (one year ahead of schedule). These savings are largely attributable to the introduction of an Energy Management Operating System (EMOS), implemented in 2013. Plant Energy Teams have been established at all Ford production facilities in Europe to implement the EMOS. We are using a range of technology and process improvements to accomplish these energy savings. For example, at our Cologne and Saarlouis assembly plants, we are recovering and using heat from paint oven exhaust stacks, air recirculation systems and paint spray booths by incorporating heat pump technology. Heat efficiency projects currently underway throughout Ford of Europe will deliver around 300 GW-h of energy savings per year from 2016 onward. In addition, many electrical efficiency projects are underway in Europe, including LED lighting replacements, building management controls and liquid pumping system controls. In total, we expect that Ford of Europe will have reduced energy consumption by 800 GW-h by the end of 2015 compared to a 2011 baseline.

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*We are on track to meet our 25 percent energy savings goal a year ahead of schedule.*

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We have also installed our “3-wet” paint process, which reduces CO<sub>2</sub> emissions by 15 to 25 percent compared to either conventional high-solids solvent-borne or waterborne painting systems at plants in Spain and Romania. Other projects aimed at saving energy include compressed air dryers, which remove moisture from the compressed air, improving paint quality.

We are also using renewable energy to reduce CO<sub>2</sub> emissions from our European plants. For example, energy required to run the Cologne plant comes from renewable sources, including three hydropower plants in Norway and Sweden. Through this initiative, Ford has reduced CO<sub>2</sub> emissions by 190,000 metric tons per year. Ford’s Dagenham Diesel Engine Assembly line in the U.K. obtains all its electricity from on-site wind turbines. And, Ford’s U.K.-based Dunton Technical Centre purchases energy from 100 percent renewable sources, including hydro, wind and waste-to-energy generation. Using renewable energy rather than energy from traditional sources eliminates an estimated 35,000 metric tons of CO<sub>2</sub> emissions annually.

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*Our use of renewable energy is helping us reduce CO<sub>2</sub> emissions from our European plants.*

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### READ MORE:

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*We have a rigorous and holistic approach to reducing the overall environmental impacts of our vehicles and facilities across the globe.*

> [Water](#)

> [Climate Change and Environment](#)

- 
1. The current atmospheric concentration of CO<sub>2</sub> is approximately 400 ppm ([www.CO2now.org](http://www.CO2now.org) accessed 3-6-15)
  2. The declared fuel consumption and CO<sub>2</sub> emissions are measured according to the technical requirements and specifications of European Regulations (EC) 715/2007 and (EC) 692/2008 as last amended. Fuel consumption and CO<sub>2</sub> emissions are specified for a vehicle variant and not for a single car. The applied standard test procedure enables comparison between different vehicle types and different manufacturers. In addition to the fuel efficiency of a car, driving behavior as well as other nontechnical factors play a role in determining a car’s fuel consumption and CO<sub>2</sub> emissions. CO<sub>2</sub> is the main greenhouse gas responsible for global warming. Results in MPG also correspond to this European drive cycle and are stated in imperial gallons. The results may differ from fuel-economy figures in other regions of the world due to the different drive cycles and regulations used in those markets.



private and academic entities.

Through the DRIVE C2X project in Europe, have been contributing to the European harmonization and standardization of wireless communication systems and applications. DRIVE C2X is the acronym for “DRIVING implementation and Evaluation of C2X communication technology in Europe” (C2X refers to “car-to-car and car-to-infrastructure” communication). This project, co-funded by the European Commission, brings together more than 40 stakeholders including manufacturers, suppliers, universities and public authorities from all over Europe. As part of this project, field operational tests in a real-world environment were conducted over the course of six to nine months in seven test sites across Europe and revealed the potential for improving traffic safety and efficiency by cooperative systems.

Ford is also one of 29 partners in the Automated Driving Applications and Technologies (AdaptIVe) research project. This consortium aims to achieve major breakthroughs leading to more efficient and safer automated driving. Ford is leading a sub-project to develop and test supervised automated driving applications in close-distance scenarios in the low-speed range. As part of this project, Ford engineers are developing a vehicle that creates a map of a parking lot with the use of ultrasonic sensors and radar, which allows navigating into small parking spots.

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*We are working with others to deliver our long-term vision of connected and automated vehicles for more efficient and safer driving.*

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**READ MORE:**

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*We are relentless in our efforts to improve product quality in all of our regions.*

> [Customer Satisfaction and Quality](#)

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*Ford has a long history of developing and implementing new innovations that improve the safety performance of our vehicles.*

> [Vehicle Safety and Accident Avoidance](#)

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1. U.S. Department of Transportation, National Highway Traffic Safety Administration, *National Motor Vehicle Crash Causation Survey: Report to Congress* (Washington, DC: U.S. DOT, July 2008).

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India, Mexico and Turkey. Overall, we trained more than 280 Ford suppliers – both direct and indirect. In 2015, Ford intends to participate in training sessions in Brazil, China and Mexico with the AIAG and in South Africa with CSR Europe. We also plan to conduct a Ford-sponsored training in Thailand.

## Building Internal Capability

We strongly believe it is important to develop not only supplier capability on these important, developing issues of supply chain sustainability, but also our internal capability. In 2014, we trained 175 new Ford Purchasing employees on supply chain sustainability fundamentals. We also provided training to our global Supplier Technical Assistance (STA) team on the basics of our human rights and working conditions program, as these personnel interact with our supplier plants on a regular basis. Our STA training reached almost 1,400 individuals globally. In 2015, we have plans to train the broader Ford Purchasing community.

### READ MORE:

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*Read a discussion of our global commitment to supply chain sustainability and detail on the status of our working conditions assessments.*

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Ford of Europe

# Our People

Here at Ford, our employees are the drivers behind our successes, and our current manufacturing expansion is the fastest and strongest in 50 years. As we continue to witness surging global demand for our products, we rely ever more deeply on the skills and talents of our dedicated global workforce of some 187,000 individuals.

Our employees are crucial to delivering our vision of building great products that contribute to a better world. As such, Ford has maintained a strong focus on employee development – including significant learning opportunities and leadership development, as well as diversity and inclusion initiatives to embrace the different perspectives and value of our global employee base.

We have many programs to promote a diverse and inclusive workplace across our European operations. In the U.K., for example, we have a robust, comprehensive Dignity at Work policy that sets out the expected standards of behavior and what steps can be taken if there are infringements of these high standards. All employees are trained on the content of the policy, with further training for supervisors and managers who investigate allegations of harassment and/or bullying.

## Employee Diversity

Across our European operations, we also have employee resource groups to support employee diversity. For example, our employee Disability and Accessibility Group supports disabled employees and helps to improve the accessibility of Ford's products and communications for all. In 2014 the group made several public presentations about individual special needs to adapt vehicles to reduced mobility. This group also initiated the use of subtitles in Ford's internal communications to improve accessibility for disabled employees, and they are working to improve the accessibility of Ford's internal and external websites.

## Health Care Strategy

Globally, we also remain committed to the One Ford health care strategy. Our goal is to build a culture of wellness that lets people perform at the top of their game at work, at home and into retirement. Our efforts are tailored to meet local health priorities and to ensure that our people receive quality health care when they need it. We focus on health screenings, educational programs and promotional campaigns. We use global health metrics (such as percentage of population at low, medium and high risk for disease) to assess the health of our workforce and track the results of our programs.

*Our Dignity at Work policy sets out the expected standards of behavior.*

*We have introduced subtitling in Ford's internal communications to improve accessibility for disabled employees.*

## Restructuring

We completed the planned closures of the Genk Belgium manufacturing facility at the end of 2014. This closure was planned and executed as the finishing step in Ford Europe's restructuring plans to manage reduced demand and thus reduced capacity requirements in the region.

### READ MORE:

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*Read more about how we support our people in all of our regions.*

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Ford of Europe

# Communities

Engaging with and investing in communities is more than the right thing to do; it's also smart business. Our global company is only as strong as the local communities in which our employees and customers live and work, so it is in our mutual interest that we work with communities to make meaningful contributions to improve the quality of life. For us, it is not just about donating money. It's also about building partnerships and working with others to address the difficult challenges so many people are facing.

Our community support is aligned with our company goals and our One Ford plan. One of the outputs of One Ford is to build a better world, and so reaching out and providing assistance to our communities is an essential part of what we do.

## Operation Better World

As we continue to expand our business in new markets across the globe, we are also expanding our community investment and volunteering efforts internationally. In 2014 we extended the global reach of our Operation Better World program. Launched in 2012, Operation Better World is a coordinated, strategic approach to how Ford engages with communities everywhere that we do business. We initially launched this program in three markets outside of the U.S. By 2015, the program had grown to reach 39 markets around the world. In 2015, we will be expanding the program to our Middle East and Africa region.

*We have launched Operation Better World to provide a coordinated, strategic approach to community engagement.*

Through Operation Better World, the [Ford Fund](#), our community relations arm, works with NGO partners in four key areas: education, auto safety, community needs and sustainability (with a focus on water). The Ford Fund oversees these programs to ensure that they meet local community needs, align with the One Ford business plan, have a measurable impact and, where possible, can be replicated in other markets. This grassroots engagement in the community is implemented and led by the local Ford teams in each region.

## A Positive Impact on Communities

Throughout Europe, Ford has made a positive impact on communities and the environment through Operation Better World initiatives such as the Community Involvement Program, the Global Week of Caring and the Ford Driving Skills for Life (DSFL) program, which teaches drivers about fuel efficiency as well as safety (as discussed in the [Vehicle Safety and Accident Avoidance](#) section).

Ford of Europe employees may spend up to 16 working hours per year

undertaking a community involvement activity at company discretion. In Germany, an all-time record 1,000 employees contributed at least 16 hours of volunteer time in 2014, funded by Ford and totaling more than 16,000 hours. At our Dunton Technical Centre in the U.K. in 2014, employees spent more than 1,140 working hours volunteering in local communities.

*Ford of Europe employees may spend up to 16 working hours per year undertaking a community involvement activity.*

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In 2000, Ford in Germany launched the Community Involvement Program, which connects Ford employees to opportunities for volunteering in the community. As of year-end 2014, 12,000 Ford employees had volunteered through this program, working on some 1,600 projects and dedicating more than 190,000 working hours (paid by Ford).

In addition, Ford actively supported Gandhi Award activities for the second time and helps to reward school students for their social engagement at Henry Ford High School in Cologne.

Ford's European operations have been recognized publicly for their sustainability efforts. For example, in 2014 Ford was the only automotive company nominated as finalist for a CSR Award from the German government, which ranked Ford among the top five most sustainable large companies in Germany. In addition, Ford received the Cologne Culture Patronate award for the fourth year in a row.

## Ford's Global Week of Caring

Ford of Europe volunteers also supported their communities as part of Ford's 2014 Global Week of Caring. In Germany alone, 24 volunteering activities were operated as Global Week Projects, and \$32,500 were invested by Ford Fund Europe. Examples of our 2014 Global Week of Caring Projects in Europe include the following:

- In Cologne, Germany, Ford volunteers built interactive educational displays at the green school of Cologne's Botanical Garden. Activities included building a "feeling and smelling" educational trail as well as raised bed for herbs and an "insect hotel" for experienced-based learning.
- In Coraivia, Romania, Ford employees worked with the nonprofit organization OncoHope on two projects. One project improved infrastructure and refurbished facilities at the state hospital to improve living conditions for sick children, including buying construction materials and hospital furniture and painting the walls, among other refurbishing activities. In the second project, Ford employees provided financial aid for medical tests and investigations for community members and organized recreation activities for children with cancer.
- In Wales, Ford employees helped to plant 50 hectares of native woodland on an old industrial site in Bridgend to create a new recreational space. In addition to community and health benefits, the planted trees capture carbon dioxide, helping to reduce climate change.

### READ MORE:

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*Read more about our community engagement and investment efforts globally.*

> [Communities](#)

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# Ford Asia Pacific

Our Asia Pacific region encompasses 12 primary markets – Australia, New Zealand, Japan, Korea, China, Taiwan, India, Thailand, Indonesia, the Philippines, Vietnam, Malaysia – and 31 additional emerging markets.

## Performance Highlights

The fastest-growing markets for automobiles are in rapidly developing countries such as China and India. We expect 60 to 70 percent of our growth in the next 10 years to come from the Asia Pacific region. Accordingly, we have increased (and are planning to increase further) our dealer networks and manufacturing capacity in the region.

We have 10 new plants in Asia Pacific, including new vehicle assembly plants in Hangzhou, China, and Sanand, India, that were inaugurated in March 2015. Combined together, the Ford assembly plants in Asia Pacific will have the capacity to produce 2.7 million vehicles by the end of 2015. These new state-of-the-art, highly flexible manufacturing facilities will help us reach the goal of increasing worldwide sales to about 8 million vehicles per year. As of year-end 2014, we employed 25,000 people in the region, up from 20,000 in 2013.

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We expect

# 60–70%

of our growth in the next 10 years to come from the Asia Pacific region.

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Ford Asia Pacific

# Welcome

“ In 2014 we continued to “Go Further” in the Asia Pacific region. We launched eight new vehicles across the region and delivered record profits of \$589 million. In China, our largest market in Asia Pacific, we set a new sales record of 1.1 million wholesale vehicles, up 19 percent from 2013. We also opened two new plants in China, both equipped with Ford’s best-in-class manufacturing technologies.



**Dave Schoch**  
President, Ford Asia Pacific

We are also implementing state-of-the-art sustainable manufacturing technologies and processes in our plants and significantly improving our environmental performance. For example, we reduced waste to landfill per vehicle produced in the region more than 60 percent compared with 2013, and a total of five plants in the region maintained zero waste to landfill. We also cut water used per vehicle produced by more than 10 percent compared to 2013 and energy use per vehicle produced by more than 7 percent compared with 2013.

As we continue our growth in the region, we are committed to going further the right way. We are not only building great products and strong business; we are also working to build a better world. This commitment is reflected in the fuel-efficient products we are launching. By the end of 2014, we offered our fuel-sipping EcoBoost® engines in 13 products in the region, and we will increase this to 20 vehicles by the end of 2015 – a five-fold increase from our EcoBoost offerings in 2012. And, we offer three hybrid electric vehicles in various Asia Pacific markets.

*“As we continue our growth in the region, we are committed to going further the right way. We are not only building great products and strong business; we are also working to build a better world.”*

We are also expanding investments in our local communities. In 2014 we continued to grow our Conservation and Environment Grant program, giving grants to support local environmental projects in 11 countries. And we expanded our Ford Driving Skills for Life program to Malaysia and Myanmar, providing free training on safe and fuel-efficient driving skills in nine markets across Asia Pacific. We also launched a new STEM strategy to support high-quality science, technology, engineering and math (STEM) education in the region. And, as part of Ford’s 2014 Global Week of Caring, more than 5,000 Ford employees volunteered 24,296 hours on 75 projects across the Asia Pacific region.

Moving forward, we will continue to focus on going further the right way, making sure that as we grow our business in the region we are also helping to build a better world and

delivering profitable and sustainable growth for all.”

**Dave Schoch**

President, Ford Asia Pacific

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Ford Asia Pacific

# Mobility

Changing times are creating exciting new opportunities for our business. At Ford, we're not just about making vehicles. We're focused on innovative, sustainable solutions for future global mobility. We're leveraging our people, products and suppliers partners to deliver mobility solutions.

Our vision is to truly change how the world moves – again. Henry Ford did that a century ago when he manufactured affordable automobiles for the masses, thereby democratizing travel. We believe we have an opportunity to revolutionize transportation once more, only this time we'll be powered by the digital economy. We aim to make the entire transportation experience easier, to improve lives.

## Addressing congestion and changing mindsets

We are focused on protecting the freedom of movement of people and goods – a freedom that is being affected by large societal megatrends such as urbanization and increased traffic congestion. To address the risks as well as the opportunities, Ford and society as a whole must change the way we think, collaborate and behave.

By harnessing the power of our people, our products and our supply chain, we are acting on our Blueprint for Mobility – our multi-decade plan for helping to develop better ways to move people and goods and thereby create a better world. In early 2015, we announced Ford Smart Mobility, which is using innovation to take Ford to the next level in connectivity, mobility, autonomous vehicles, big data and the customer experience. As the first step, in 2014 we kicked off mobility experiments around the globe – all designed to test new mobility concepts and evaluate their impact on the environment, while creating value for our business at the same time. We are also hosting a global Innovate Mobility Challenge series, an open-innovation approach to discovering mobility solutions around the world.

We're tying together the promise of connected and autonomous vehicles with a broader transportation network that can make traveling from Point A to Point B easier than ever, whether in crowded cities or remote rural landscapes. We're developing advanced new vehicles and new mobility solutions that, when coupled with other modes of transportation, will change the way the world moves by improving safety, reducing congestion and lowering greenhouse gas emissions.

By driving toward unfettered access to mobility, we can enable human progress. We view

*We have an opportunity to revolutionize transportation once more.*

*Blueprint for Mobility is our multi-decade plan for helping to develop better ways to move people and goods.*

*We want to help make it easier and safer to travel from Point A to Point B, with lower greenhouse gas emissions too.*

the disruption that's taking place in mobility as something to embrace – not fear. We want Ford to be part of the solution by redefining what's possible.

## Mobility experiments across Asia Pacific

Several of our current mobility innovation challenges are in our Asia Pacific region. For example:

- **Share Car Bangalore:** In Bangalore, India, Ford is working with Zoomcar to test a sharing concept that would allow a closed, small groups of peers – such as co-workers, apartment dwellers and families – to share a vehicle among multiple drivers. The approach helps consumers who can't afford a car but want the benefits of owning one. Researchers plan to develop a model for vehicle scheduling and managing ownership for sharing among these small communities.
- **Monsoon App Downpour:** Mumbai, India, is known for its monsoon rains in the middle of summer. The heavy rains last up to four months and result in flooded roads and railways that create long delays for the 12 million residents of the area. People simply can't get around to do what they need to do. This challenge was won by Mumbai Monsoon Helper, an app that allows users to plan routes around the most water-soaked areas by providing current weather details, forecasts and maps. The information is gathered through crowd-sourcing. Planned enhancements for the app include navigation around flooded areas by prioritizing recently reported floods and areas of receding water.
- **Mobility Integration:** Chongqing, China, is challenged by drastic geographical changes and extreme congestion, requiring multiple modes of transportation that struggle to move people into, out of, and through the city quickly and efficiently. Ford asked app developers to come up with a way to make commuting easier by connecting multiple transportation options on a single trip. The challenge was won by MultiModal Transportation Platform, an app that combines city-based mass-transit options, including buses and trains, with localized transportation, including bicycle rentals and rickshaws, to get people where they want to go while saving fuel and reducing congestion. The app finds high-traffic areas and alternative routes and nearby transportation options with maps, and provides contact information for services, pricing, line changes for buses, subways, railways and more.

### READ MORE:

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*Read more about our efforts to reshape mobility.*

> [Mobility](#)

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Ford Asia Pacific

# Climate Change and Environment

At Ford, we have been working for many years to reduce the environmental impacts of our vehicles and operations.

For example, Ford recognizes the risks and opportunities climate change poses, and we are committed to doing our share to prevent or reduce the potential for environmental, economic and social harm due to climate change. To make good on this commitment, we have analyzed what “doing our share” means according to the science of climate change.

We set emission reduction goals for our products by region and manufacturing operations based on stabilizing the atmospheric concentration of carbon dioxide (CO<sub>2</sub>) at 450 parts per million (ppm), the level that many scientists, businesses and governmental agencies believe may avoid the most serious effects of climate change. We are on track to meet the central elements of our strategy. For each of our new or significantly refreshed vehicles, we offer a powertrain with leading fuel economy, and we are reducing greenhouse gas (GHG) emissions across our global product portfolio. We are on track to meet our goals to reduce our facility CO<sub>2</sub> emissions by 30 percent from 2010 to 2025 on a per-vehicle basis and to reduce our average energy consumed per vehicle by 25 percent from 2011 to 2016 globally.

*We are on track to meet the central elements of our strategy and are reducing GHG emissions across our global product portfolio.*

## Vehicles

We are delivering on our climate change commitments in Asia Pacific by introducing fuel-efficiency technologies and electrified vehicles. We now offer three electrified vehicles in the Asia Pacific region: the Lincoln MKZ Hybrid and Ford Fusion Hybrid in South Korea and the Ford C-MAX Hybrid in Guam. We will be offering the Ford Mondeo Hybrid in Taiwan beginning in mid-2015.

## EcoBoost® Engines

We are also launching more vehicles equipped with the EcoBoost® engine, in response to growing consumer demand for more fuel-efficient vehicles. In 2014, EcoBoost was available in 13 vehicles in Asia Pacific, and by the end of 2015 we will offer it in more than 20 vehicles, a five-fold increase from 2012.

- The 1L I-3 EcoBoost is offered in the region on the Ford Fiesta, which is available in Australia, China, Japan, New Zealand, Taiwan, ASEAN and APEM,<sup>1</sup> and on the EcoSport, which is available in Australia, China, India and New Zealand.
- The 1.5L I-4 EcoBoost is available on the new Ford Mondeo in China.
- We also offer the 1.6L and 2.0L I-4 EcoBoost variants on the Ford Edge, Kuga/Escape, Mondeo/Fusion, Falcon, Focus ST, Fiesta ST, Taurus and Explorer, and the Lincoln MKZ and MKC.

By 2015 we will offer EcoBoost in Asia Pacific in more than

**20**  
vehicles

- We offer the 2.3L EcoBoost in the all-new Ford Mustang.

In March 2014, Ford's joint venture, Changan Ford Automobile Co., Ltd. (CAF), began producing 1L EcoBoost engines at a new engine plant in Chongqing, to power the Ford Fiesta and EcoSport vehicles built for China.

The fuel-efficient EcoBoost engines are being well received by our customers in the Asia Pacific region. In 2014, sales of EcoBoost-equipped vehicles in Asia Pacific increased 63 percent from a year earlier. In China alone, sales were up 59 percent.

## China

In China, Ford will upgrade its entire powertrain portfolio with 20 advanced engines and transmissions to support our aggressive plan to introduce 15 new vehicles to China by the end of 2015. These advanced, fuel-efficient technologies – including turbocharging, direct injection, twin independent variable camshaft timing (Ti-VCT) and six-speed transmissions – will deliver a more than 20 percent improvement in fuel economy to our passenger vehicle fleet in China by the end of 2015, which represents a key part of our near-term sustainability goals in China.

## India

In India, we are also continuing to introduce vehicles with excellent fuel economy. We offer a 1.0L EcoBoost on the Ford EcoSport, the first vehicle in India to have this technology. We also continue to offer the Ford Fiesta, powered by a TDCi diesel powertrain that delivers outstanding fuel economy and reduced CO<sub>2</sub> emissions. This strengthens Ford's efforts to deliver great fuel economy, which were established with the Ford Figo, launched in March 2010. The Figo is offered with two engine options: a fuel-efficient 1.4L TDCi diesel and a very competitive 1.2L gasoline engine.

## Australia

In Australia, we offer the 1.0L EcoBoost on the Fiesta and all-new EcoSport. We also offer EcoBoost versions of the Ford Mondeo, Falcon, Fiesta ST, Focus ST and Kuga. Also in Australia, we offer our EcoLPi liquid-injection liquefied petroleum gas (LPG) system for the Falcon, providing customers with the most advanced LPG technology on the market. The Falcon EcoLPi fuel system improves fuel economy by 12 to 15 percent, while also improving power by approximately 27 percent over the prior LPG Falcon model.

## Reducing Non-CO<sub>2</sub> Tailpipe Emissions

We are also addressing non-CO<sub>2</sub> tailpipe emissions in the region. Since 2010, our new gasoline-fueled passenger vehicles have been designed to comply with China IV requirements (based on Euro 4 standards). China began implementing more recent European standards (Euro 5) in Beijing in 2013. Korea and Taiwan have adopted very stringent U.S.-based standards for gasoline vehicles and European-based standards for diesel vehicles. Japan, which has unique standards and test procedures, began implementing more stringent standards in 2009. Ford is working to comply with all of these standards using a variety of approaches, including onboard diagnostics and after-treatment technologies.

## Eco-Driving Training

In Asia Pacific, we launched the [Ford Driving Skills for Life \(Ford DSFL\)](#)

### OUR PERFORMANCE

Sales of EcoBoost-equipped vehicles in Asia Pacific

↑ 63%

compared to the previous year.

*We are working to comply with all non-CO<sub>2</sub> tailpipe emissions standards being implemented by authorities in the region.*

[driver training program](#) in 2008. In this region the program places equal emphasis on safe driving and eco-driving, as customers are interested in both. In 2014, the program continued in mainland China, India, Taiwan, Thailand, Indonesia, Vietnam and the Philippines, as well as expanded to Malaysia and Myanmar. Approximately 90,000 people have been trained in the Asia Pacific region since the program began. We are expanding Ford DFSL to more markets in 2015.

Ford has provided safe driving and eco-driving training to around

90,000  
people in the region.

## Sustainable Manufacturing

We are improving the environmental performance of our existing plants in Asia Pacific and designing our new plants to include state-of-the-art environmental technologies. For example, we have implemented our energy- and water-efficient [“3-wet” painting](#) process at plants in China, India and Thailand. Some highlights of our environmental performance in 2014 include the following:

- We cut energy use per vehicle produced in the region by more than 7 percent compared with 2013.
- We reduced water use per vehicle produced by 10 percent compared to 2013. As part of our global water strategy, we conducted water assessments at two more plants this year to better understand water usage and opportunities for improvement. In addition, multiple plants now recycle and reuse their wastewater to reduce fresh water demands.
- We reduced waste to landfill per vehicle produced in the region by 64 percent compared with 2013. And, five plants in the region are zero waste to landfill.
- The Chongqing Transmission Plant received our internal Five STAR (Sustainability Tracking and Rating) recognition.
- The Chennai Engine Plant won the Asia Pacific regional 2014 Environmental Leadership Award for their ongoing effort to reduce carton and wood waste by more than 30 percent via replacement with returnable packages for material shipment. The plant reduced carton and wood pallet waste by more than 12 tons per month.

### READ MORE:

*We have a rigorous and holistic approach to reducing the overall environmental impacts of our vehicles and facilities across the globe.*

> [Climate Change and Environment](#)

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1. ASEAN is the Association of Southeast Asian Nations. APEM is Asia Pacific Emerging Markets

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Ford Asia Pacific

# Product Quality and Safety

At Ford, we design and manufacture vehicles that achieve high levels of quality and vehicle safety for a wide range of people over a broad spectrum of real-world conditions.

In 2014, our key measures of quality and satisfaction improved compared to 2013, for example:

- Customer satisfaction increased to 69 percent, up 1 percentage point compared with 2013.
- Sales satisfaction with dealer or retailer improved 9 points compared with 2013. Service satisfaction with dealer or retailer improved by 8 points in that time.

*Our key measures of quality and satisfaction improved compared to 2013.*

## Encouraging Safer Driving

Driver behavior is a key contributing factor in many vehicle crashes.<sup>1</sup> We at Ford have developed and support an array of programs and technologies that help to encourage safer behavior on the roadways, for both experienced and novice drivers.

In many Asian, Middle Eastern and African markets, it's not just teenagers who are first-time drivers. As more and more people are able to afford vehicles, the number of people of all ages who are driving a car for the first time is increasing rapidly. In many of these developing markets, the overall percentage of drivers who are first time drivers is much higher than in developed markets. In Asia Pacific, therefore, our Ford Driving Skills for Life (Ford DSFL) driver education program is aimed at novice drivers of all ages.

Ford DSFL in Asia Pacific focuses on many elements of safe driving, including developing good safe driving habits, road courtesy, lane maintenance and vehicle maintenance. Also, in this region the program places equal emphasis on safe driving and eco-driving, as customers are interested in both. In 2014, Ford DSFL continued in mainland China, India, Taiwan, Thailand, Indonesia, Vietnam and the Philippines, as well as expanded to Malaysia and Myanmar. More than 90,000 people have been trained in the Asia Pacific, Middle East and Africa regions since the program began. In 2015 we will expand to more markets.

*In Asia Pacific our Ford Driving Skills for Life program is aimed at novice drivers of all ages and places equal emphasis on safe driving and eco-driving.*

Some highlights of our Ford DFSL program in Asia Pacific include the following:

- In Myanmar, the Ford DFSL sessions in 2014 gave drivers the opportunity to learn safe and green driving practices in a safe and controlled environment. Many participants

commented afterward that the information and chance to practice the theory they learned was invaluable.

- In Malaysia, our Ford DSFL sessions included a focus on maintaining control in wet conditions, due to Malaysia's high rainfall and tropical climate.
- In Indonesia, Ford DSFL was expanded to more cities in 2014, and we organized a special program for people with disabilities and their families.
- In Taiwan, we are working with NGO partners to improve road safety education for women, children and young drivers.
- In Vietnam, Ford DSFL has reached to 8,500 drivers in 14 cities and provinces since 2008. Ford Vietnam has localized the content of Ford DSFL with useful tips for driving in flooded areas, with automatic transmission, and on mountainous roads. Under the umbrella of Ford DSFL, Ford Vietnam has also run a social campaign since 2012 called No Honking, to address this behavior. The No Honking campaign has more than 28,600 followers and supporters on Facebook.
- In China, Ford DSFL was brought to college campuses in 2014.
- In India in 2015, we are launching a new Ford DSFL sub-program called Cartesy, which is aimed to promote courtesy on Indian roads.

## Improving the Safety Performance of Our Vehicles in Asia Pacific

Ford is a leader in technological innovations that are designed to enhance safety. For example:

- We are rolling out more driver assistance technologies in Asia Pacific. The new Ford Everest, which offers Adaptive Cruise Control and Forward Alert, is an example of how Ford is leading the way in democratizing technology throughout the region.
- We now also offer Emergency Assistance in the Asia Pacific region – it is available on the entire range of our Australian passenger and commercial vehicles.
- We launched rear-seat inflatable safety belts in Asia Pacific on the new Mondeo and will expand this technology to the Ford Edge in China in 2015.

In addition, MyKey® – Ford's innovative technology designed to help parents encourage their teenagers to drive more safely and to keep young drivers focused on the road – was introduced to even more nameplates in the region in 2014, including the Ford Fiesta and Mondeo.

### READ MORE:

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*We are relentless in our efforts to improve product quality in all of our regions.*

> [Customer Satisfaction and Quality](#)

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*Ford has a long history of developing and implementing new innovations that improve the safety performance of our vehicles.*

> [Vehicle Safety and Accident Avoidance](#)

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1. U.S. Department of Transportation, National Highway Traffic Safety Administration, *National Motor Vehicle Crash Causation Survey: Report to Congress* (Washington, DC: U.S. DOT, July 2008).

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Ford Asia Pacific

# Supply Chain

The automotive supply chain is one of the most complicated of any industry. Automakers like Ford rely on thousands of suppliers to provide the materials, parts and services necessary to make our final products. We promote long-term relationships with our suppliers and seek alignment with them on sustainability-related issues such as human rights, working conditions, conflict minerals and environmental responsibility.

The basis of our work with suppliers is the Ford Code of Human Rights, Basic Working Conditions and Corporate Responsibility, which applies to our own operations as well as our \$100 billion supply chain. The Code addresses workplace issues such as working hours, child labor and forced labor, as well as nondiscrimination, freedom of association, health and safety, the environment and other issues.

We work to ensure that Ford and our suppliers have management systems in place to mitigate potential risks, ensure continuity of supply and improve the overall sustainability of the complex global automotive supply chain. Our aim is to leverage our supply chain – and our industry – to make a positive impact in the markets in which we do business.

*With our suppliers, we seek to make a positive impact in the markets in which we do business.*

## Our Approach

Our goals to control costs, improve quality and meet sustainability targets require an unprecedented level of strong relationships and shared commitments with our suppliers. We proactively engage our supplier partners to develop a sustainable supply chain, and we:

1. Communicate our expectations to our suppliers
2. Assess our suppliers for environmental and social performance
3. Build our suppliers' environmental and social capability
4. Collaborate with industry and cross-industry organizations to develop common solutions in a noncompetitive environment

## Training for Suppliers

Since 2007, Ford has led or participated in supplier human rights training sessions in Argentina, Brazil, China, India, Mexico, Romania, Russia, Thailand, Turkey and Venezuela. In 2014, we held joint industry trainings in Russia through the Automotive Industry Action Group (AIAG) and conducted independent Ford training sessions in Brazil, China, India, Mexico and Turkey. Overall, we trained more than 280 Ford suppliers – both direct and indirect. In 2015, Ford intends to participate in training sessions in Brazil, China and Mexico with the AIAG and in South Africa with CSR Europe. We also plan to conduct a

Ford-sponsored training in Thailand.

## Building Internal Capability

We strongly believe it is important to develop not only supplier capability on these important, developing issues of supply chain sustainability, but also our internal capability. In 2014, we trained 175 new Ford Purchasing employees on supply chain sustainability fundamentals. We also provided training to our global Supplier Technical Assistance (STA) team on the basics of our human rights and working conditions program, as these personnel interact with our supplier plants on a regular basis. STA training reached almost 1,400 individuals globally. In 2015, we have plans to train the broader Ford Purchasing community.

### READ MORE:

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*We have made a global commitment to supply chain sustainability.*

> [Supply Chain](#)

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*Read more about the status of our working conditions assessments.*

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Ford Asia Pacific

# Our People

Here at Ford, our employees are the drivers behind our successes, and our current manufacturing expansion is the fastest and strongest in 50 years. As we continue to witness surging global demand for our products, we rely ever more deeply on the skills and talents of our dedicated workforce of some 187,000 individuals.

Our employees are crucial to delivering our vision of building great products that contribute to a better world. As such, Ford has maintained a strong focus on employee development – including significant learning opportunities and leadership development as well as diversity and inclusion initiatives to embrace the different perspectives and value of our global employee base.

Ford's expansion in Asia Pacific is unprecedented. About five years ago, we saw the huge potential for growth in Asia and began an extraordinary ramp-up of new manufacturing facilities, especially in China, India and Thailand, to meet consumer demand for our vehicles. To build the pipeline of talented people necessary to run and manage these operations, we developed a comprehensive talent strategy for the region.

*Ford's expansion in Asia Pacific is unprecedented.*

## Positioning Ford as an Employer of Choice

A key aspect of this strategy has been positioning Ford as an employee of choice in the region, by identifying and then sharing our value proposition with both potential and existing employees. We have conducted research to understand what is important to existing employees, conducted exit interviews around why people choose to leave, and made an effort to understand the perspectives and perceptions of new hires, both experienced and Generation Y. Our ability to uncover insights, stories and perceptions of these stakeholder groups has allowed us to understand Ford's position in the Asian market – a society that is exceptionally well connected and where stories can travel fast through family, friends and social networks.

Our existing employees then serve as ambassadors in the marketplace, sharing their experiences working with Ford and touting our collaborative and flexible work culture. Ford's success in Asian markets has also served as a differentiator in our employer branding efforts. With record profits and an expanding and popular product lineup, we have come to be seen as a desirable place to work.

*In our Asia Pacific region, Ford enjoys higher than average attraction and retention rates.*

All of these efforts have led to attraction and retention rates higher than the average in the region.

In addition to functional and technical training and a strong portfolio of leadership development offerings, in growth markets such as Asia we are working to develop local

leaders (versus moving leaders in from other developed markets) by providing 12 to 24 months of leadership development programs and tailor-made development plans for individuals.

We also marked the fourth consecutive year of zero fatalities among Ford employees in 2014. However, there were four fatalities among contractors involved in construction projects at our facilities, one of which occurred in China. As a result, we are continuing to emphasize changing the safety culture not only of our own employees, but also that of the thousands of contractors and vendors we hire to clean our facilities, remove trash and scraps, cook meals in cafeterias and maintain equipment, among other outsourced tasks.

**READ MORE:**

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*Read more about how we support our people in all of our regions.*

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Ford Asia Pacific

# Communities

Engaging with and investing in communities is more than the right thing to do; it's also smart business. Our global company is only as strong as the local communities in which our employees and customers live and work, so it is in our mutual interest that we work with communities to make meaningful contributions to improve the quality of life. For us, it is not just about donating money. It's also about building partnerships and working with others to address the difficult challenges so many people are facing.

Our community support is aligned with our company goals and our One Ford plan. One of the outputs of One Ford is to build a better world, and so reaching out and providing assistance to our communities is an essential part of what we do.

## Operation Better World

As we continue to expand our business in new markets across the globe, we are also expanding our community investment and volunteering efforts internationally. In 2014 we extended the global reach of our Operation Better World program. Launched in 2012, Operation Better World is a coordinated, strategic approach to how Ford engages with communities everywhere that we do business. We initially launched this program in three markets outside of the U.S. By 2015, the program had grown to reach 39 markets around the world. In 2015, we will be expanding the program to our Middle East and Africa region.

*We have launched Operation Better World to provide a coordinated, strategic approach to community engagement.*

Through Operation Better World, the [Ford Fund](#), our community relations arm, works with nongovernmental organization (NGO) partners in four key areas: education, auto safety, community needs and sustainability (with a focus on water). The Ford Fund oversees these programs to ensure that they meet local community needs, align with the One Ford business plan, have a measurable impact and, where possible, can be replicated in other markets. This grassroots engagement in the community is implemented and led by local Ford teams in each region.

## A Positive Impact on Communities

We have a long history of supporting communities in Asia Pacific. By building new plants we are creating jobs and opportunity in the region. But we are also expanding our community investment efforts in other ways.

### Education, Health and Sustainability Projects

For example, ahead of the launch of our plant in Sanand, India, the company has

undertaken several projects to support education, health and sustainability in the local community. In particular, Ford is working to provide safe drinking water to children in kindergartens run by the government in 70 villages. We have also introduced our Happy Schools program (described below) in 10 schools close to the plant. Additional benefits for the community will come from our suppliers, who have also moved to the Gujarat area and are setting up facilities within close proximity to Ford's plant, bringing in additional investment and creating employment opportunities.

We are also investing in science, technology, engineering and math (STEM) education programs across the region as part of our community investment efforts, but also to build a pool of potential employees. Some examples of our STEM efforts include the following:

- We are supporting educational programs with local elementary and secondary schools, including workshops for teachers in China, Australia and India.
- We are also partnering with local colleges to help build technical skill trades programs, as well as engineering and logistics programs.
- We are supporting educational and outreach programs to support and attract female talent into STEM careers.
- As part of our [Blue Oval Scholars program](#), we are awarding several \$2,500 individual, renewable scholarships for outstanding students pursuing majors in STEM fields.

## Happy Schools Program in India

In India, we launched the Happy Schools program in 2014, a long-term intervention focused on democratizing access to primary education. As part of the program, Ford has partnered with reputable NGOs working in the field of education to collectively conceptualize and design a social intervention model that addresses gaps identified in the schools. Besides academic support and infrastructure enhancement, the program focuses on improving the overall health status of the children, as well as introducing application-based learning and a structured arts curriculum. A critical component of the program is engagement with key stakeholders, including school administrators, teachers and parents, in order to create sustained support systems for the students. So far the program has been implemented in 20 schools in Chennai. As noted above, Ford India is also expanding the program to cover 10 schools near the new facility in Sanand, Gujarat.

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*Ford launched Happy Schools in 2014 in India: a long-term program focused on democratizing access to primary education.*

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## Conservation & Environmental Grants Program in China

We are continuing to expand our Conservation & Environmental Grants (CEG) program, the company's flagship philanthropic program in China focused on supporting grassroots environmental/sustainability NGO leaders and their organizations. Over the past 14 years, Ford of China has awarded more than \$3 million in grants to 354 grassroots environmental leaders and NGOs. In 2014 we provided grants for projects in China, South Korea, Malaysia, Myanmar, Hong Kong, Mongolia, Tahiti, Laos, Cambodia, Sri Lanka and Fiji, and in 2015 we will expand the program to Thailand.

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*More than \$3 million in grants awarded to approximately 350 grassroots environmental leaders and NGOs.*

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## Investing in Communities in Australia

Ford is also investing more in Australia than any other auto company – more than \$300 million in 2015 on top of nearly \$2 billion the past six years. One example of our investment is our sponsorship of the 2015 Australian Regional For Inspiration and Recognition of Science and Technology (FIRST) Robotics Competition (FRC). The FRC is an internationally acclaimed program that aims to ignite passion in young participants aged 14–18 who are

looking to pursue a career in the science, technology, engineering and mathematics industries. This partnership is more than a sponsorship, as Ford's vehicles increasingly feature advanced sensor- and radar-based technologies that are similar to those needed to guide robots.

## Ford's Global Week of Caring

As part of Ford's 2014 Global Week of Caring, more than 5,000 Ford employees volunteered 24,296 hours on 75 projects across the Asia Pacific region. Projects included the following:

- In China, Ford volunteers helped families build eight water cellars in an arid area of southwest China. The cellars will collect and store rainwater during the rainy season, so it is available during the dry season. Also, volunteers organized a one-day activity to raise awareness of water conservation and use.
- In India, Ford volunteers installed water purifiers in five schools, giving students and staff access to safe drinking water. Volunteers also educated students, staff and local community residents about water conservation and gave them handy tips to encourage more sustainable water usage.
- In the Philippines, Ford volunteers engaged in two projects to restore the water supply in the village of Villaba, which was hit hard by Super Typhoon Yolanda (Haiyan) in November 2013. Six months after the disaster, most people in the region still had not recovered. As part of the project, volunteers provided 50 concrete top stand faucets, each benefiting five families.

### READ MORE:

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*We are engaging with and investing  
in our communities across the globe.*

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# Ford South America

Ford's principal markets in South America include Brazil and Argentina; we were the fourth-largest automaker in both markets in 2014. Though the overall market for vehicles in both of these countries declined in 2014, we maintained our market share in Brazil and South America as a whole and increased market share in Argentina. We employ 16,000 people and have eight manufacturing plants in the region.

## Performance Highlights

- In April 2014, Ford opened a new engine plant in Camaçari, Brazil. We invested 400 million Brazilian real in the plant, which will create 300 new direct jobs. The factory will produce the new generation of three-cylinder engines for compact vehicles such as the all-new Ford Ka.
- In 2014, Ford Argentina increased its market share to 14.1 percent – 1.5 percentage points higher than in 2013 and our highest market share in the country in seven years. We delivered 95,500 vehicles and improved to the second overall industry sales position, from the fourth in 2013.
- Also 2014, we launched the new Ka – the second product created by Brazilian engineering for major world markets. We also introduced many technologies for the first time in Brazil on this vehicle. For example, as part of our strategy to democratize technology, we launched SYNC® AppLink™ on the new Ka. This innovative technology allows drivers to control their smartphones with voice commands so they can keep their eyes on the road and hands on the wheel.

## Awards

- In 2014, Ford Argentina received 10 awards distinguishing our corporate reputation, including first place in the Most Trusted Brands ranking in the category of vehicle and pickup companies, awarded by *Selecciones (Reader's Digest)* magazine.
- In Brazil in 2014, Ford vehicles won more than 30 awards from over 10 different vehicle-related publications. For example, the Ford Fusion Hybrid won multiple awards, including “best green car” awards from *Vrum* and *Abiauto* magazines.

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program's reach to include employees' families and the communities in which we operate.

As sustainability is a concept permeating all of our production processes, we continued the implementation of state-of-the-art technologies in our South American plants aimed at reducing water use, energy consumption and waste production. Our transmission plant in Taubaté and engine plant in Camaçari both achieved zero-waste-to-landfill status in 2014, which shows how Ford is going further to reduce waste and improve the environment in the communities in which we operate.

2014 was both an exciting and a demanding year in our South American operations. We faced challenging economic conditions, which resulted in decreased sales across the industry and at Ford. Despite these difficult conditions, we maintained our market share in Brazil and South America as a whole and increased market share in Argentina.

As we continue to implement the One Ford plan, we are investing in a strong future for the region, built on strong products, a great business, and efforts to make this a better world.”

**Steven Armstrong**

President, Ford South America

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Ford South America

# Mobility

Changing times are creating exciting new opportunities for our business. At Ford, we're not just about making vehicles. We're focused on innovative, sustainable solutions for future global mobility. We're leveraging our people, products and supplier partners to deliver mobility solutions.

Our vision is to truly change how the world moves – again. Henry Ford did that a century ago when he manufactured affordable automobiles for the masses, thereby democratizing travel. We believe we have an opportunity to revolutionize transportation once more, only this time we'll be powered by the digital economy. We aim to make the entire transportation experience easier, to improve lives.

*Our vision is to truly change how the world moves – again.*

We are focused on protecting the freedom of movement of people and goods – a freedom that is being affected by large societal megatrends such as urbanization and increased traffic congestion. To address the risks as well as the opportunities, Ford and society as a whole must change the way we think, collaborate and behave.

## Our Blueprint for Mobility

By harnessing the power of our people, our products and our supply chain, we are acting on our Blueprint for Mobility – our multi-decade plan for helping to develop better ways to move people and goods and thereby create a better world. In early 2015, we announced Ford Smart Mobility, which is using innovation to take Ford to the next level in connectivity, mobility, autonomous vehicles, big data and the customer experience. As the first step, in 2014 we kicked off 25 mobility experiments around the globe – all designed to test new mobility concepts and evaluate their impact on the environment, while creating value for our business at the same time. We are also hosting a global Innovate Mobility Challenge series, an open-innovation approach to discovering mobility solutions around the world.

We're tying together the promise of connected and autonomous vehicles with a broader transportation network that can make traveling from Point A to Point B easier than ever, whether in crowded cities or remote rural landscapes. We're developing advanced new vehicles and new mobility solutions that, when coupled with other modes of transportation, will change the way the world moves by improving safety, reducing congestion and lowering greenhouse gas emissions.

*We have kicked off 25 mobility experiments around the globe.*

By driving toward unfettered access to mobility, we can enable human progress. We view the disruption that's taking place in mobility as something to embrace – not fear. We want Ford to be part of the solution by redefining what's possible.

## Mobility Experiments

One of our Smart Mobility innovation challenges is in South America. For our **Future of Mobility challenge** in Argentina we asked for innovative ideas to reduce traffic jams, which are environmentally and economically sustainable. Urban Shuttle, the challenge winner, is a mass-transit vehicle that allows drivers of two-seat electric shuttle cars to commute into the city together on a bus-shaped car carrier – combining the efficiency of public transportation with the freedom of movement of a private car. By transporting cars into the city center as a group, traffic is reduced, and commuters still have the freedom to move about the city as necessary. Both the bus and cars are electrically powered, reducing emissions.

Also in Argentina, we organized the Future of Mobility Forum in November 2014, which brought together local and international specialists in mobility, technology and innovation in different areas, including urban planning, industry, government and entrepreneurship, among others. The experts provided their perspectives regarding future scenarios and possible solutions to the transport problems of large cities.

## Mobility Options for Ford Employees

In line with the Blueprint for Mobility, Ford Argentina is advancing more sustainable mobility options for its employees. Ford Argentina has implemented a carpooling platform for employees at the Pacheco plant. The system gives Ford employees an easy and efficient way to share car trips to work. In this way, the platform helps to reduce travel costs, carbon dioxide emissions and cars on the road in the area. Since its launch in November, 362 employees have registered in the platform and taken more than 290 daily trips. The car-sharing platform, developed by SincroPool, uses an algorithm that searches for matches between drivers and passengers using different criteria so each user can adapt their trips according to their own needs.

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*Since launch, 362 employees have registered in Ford Argentina's carpooling platform at the Pacheco plant.*

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### READ MORE:

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Read more about our efforts to reshape mobility.

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Ford South America

# Climate Change and Environment

At Ford, we have been working for many years to reduce the environmental impacts of our vehicles and operations.

For example, Ford recognizes the risks and opportunities climate change poses, and we are committed to doing our share to prevent or reduce the potential for environmental, economic and social harm due to climate change. To make good on this commitment, we have analyzed what “doing our share” means according to the science of climate change.

We set emission reduction goals for our products by region and manufacturing operations based on stabilizing the atmospheric concentration of carbon dioxide (CO<sub>2</sub>) at 450 parts per million (ppm), the level that many scientists, businesses and governmental agencies believe may avoid the most serious effects of climate change. We are on track to meet the central elements of our strategy. For each of our new or significantly refreshed vehicles, we offer a powertrain with leading fuel economy, and we are reducing greenhouse gas (GHG) emissions across our global product portfolio. We are on track to meet our goals to reduce our facility CO<sub>2</sub> emissions by 30 percent from 2010 to 2025 on a per-vehicle basis, and to reduce our average energy consumed per vehicle by 25 percent from 2011 to 2016 globally.

*We are on track to meet our CO<sub>2</sub> emissions reduction and energy consumption goals for our facilities.*

## Vehicles

We are improving the fuel economy of our vehicles in our South America region by introducing some of the efficient engine and transmission technologies currently used in North America, and by offering technologies compatible with the widespread use of biofuels in Brazil.

In Brazil, our largest market in the region, we introduced a 1.6L dual-clutch automatic version of the Ford EcoSport. The Ford Ka and Ka+ lead the compact and medium categories for fuel efficiency in the [new Brazilian fuel-efficiency labeling program](#), due to their low-internal-friction 1L three-cylinder PFI engine.

*The Ford Fusion Hybrid, available in Brazil, is the most fuel-efficient vehicle in the Brazilian market.*

We offer one electrified vehicle in South America: the Ford Fusion Hybrid, which is available in Brazil and is the most fuel-efficient among all vehicles in this market. We also offer the EcoBoost® engine on the Ford Mondeo and Kuga in Argentina and the Ford Fusion in Brazil. We are introducing Auto Start-Stop technology on the freshened version of the Fusion in Brazil.

We are continuing to implement the new, more-efficient Sigma engine, which improves efficiency compared to current engines through reduced internal friction and improved electronic throttle controls. We have also improved the gearing ratios, aerodynamics and tire rolling resistance of our South American models, further increasing fuel economy.

Over the past few years, we have successfully implemented a large number of additional fuel-efficiency technologies in our B- and C-sized vehicle segments, which make up approximately 80 percent of the Brazilian market. These include twin independent variable cam timing engines and direct-injection engines, Battery Management Systems, electric power steering, smart alternator systems and dual-clutch automatic transmissions.

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*We have implemented a large number of fuel efficiencies in our B- and C-sized vehicle segments in Brazil.*

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Ford is also using recycled and/or natural materials in our vehicles in South America. All vehicles locally produced use 5 to 6 kg of recycled material, including PET plastic and other materials in the form of carpets, ceiling linings, wheel boxes and acoustic blanket carpeting. And, the instrument panel of the new cargo trucks is made with sisal natural fiber.

## Sustainable Manufacturing

We are implementing state-of-the-art technologies and processes at our facilities in South America to reduce our environmental impacts, and these efforts are having significant results. From 2010 to 2014, for example, the Sao Bernardo do Campo (SBC) and Camaçari plants in Brazil reduced water consumption by 60 percent, the equivalent to 40 Olympic-sized swimming pools per plant. We surpassed our goal – several years early – to reduce water use per vehicle produced to 3.8 m<sup>3</sup> per vehicle by 2015.

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*We achieved a key goal to reduce water use per vehicle several years ahead of schedule.*

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### Water Reduction

Some examples of the water-saving technologies and processes we have implemented in the region include the following:

- We implemented the Minimum Quantity Lubricant (MQL) process at a new engine plant in Brazil.
- We adopted a dry vehicle cleaning process to wash cars that reduces water use by 90 percent and uses environmentally friendly products.
- We are reusing water from the painting process, which saves approximately 1,200 m<sup>3</sup> of water per day – or about half of an Olympic-sized swimming pool.
- We have implemented more efficient water cooling tower processes.
- We are replacing underground water pipes with above-ground pipes, which facilitates the identification and correction of leaks.
- We are installing customized water meters to help improve control of water use and identification and reduction of waste.

### Waste to Landfill

We are also reducing our waste to landfill and increasing recycling. For example, Ford Argentina recycled 95.7 percent of all waste (hazardous and nonhazardous) generated in the plant in 2014. Examples of our recycling programs in Argentina include the following:

- We recycle all nylon scrap generated in the plant; the nylon is used to manufacture plastic bags for waste collection. In 2014 we recycled 180,460 kilos of plastics.
- We recycled 23,880 kilograms of scrap tires in 2014, helping with a major environmental and health issue.

### Energy Initiatives

Our plants in the region are also reducing energy use. We were the first automaker in Brazil to voluntarily report our GHG emissions to

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*We were the first*

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the Brazilian Greenhouse Gas Protocol. As a participant and one of the founders of the Protocol, we have conducted an inventory of our facility emissions and have set reduction goals.

Compared to our 2010 as baseline, we reduced absolute GHG emissions from our Brazilian facilities by 19 percent and our per-produced-unit GHG emissions by 11 percent, even with the launch of a new engine facility. In addition, the Pacheco plant in Argentina has reduced GHG emissions by nearly 15 percent since 2012.

**READ MORE:**

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*We have a rigorous and holistic approach to reducing the overall environmental impacts of our vehicles and facilities across the globe.*

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*automaker in Brazil to voluntarily report our GHG emissions to the Brazilian Greenhouse Gas Protocol.*

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### Ford South America

# Product Quality and Safety

At Ford, we design and manufacture vehicles that achieve high levels of vehicle safety and quality for a wide range of people over a broad spectrum of real-world conditions.

In the most recent Latin NCAP,<sup>1</sup> the new Ford EcoSport and Focus both received five stars for adult protection. The EcoSport and Focus are the first vehicles produced in South America to earn a five-star ranking from the international safety rating organization.

The new EcoSport brings advanced systems for both passive and active protection, to prevent accidents and ensure that the vehicle is in control under various driving conditions. The EcoSport comes with front airbags as standard, offers side curtain airbags as optional and is the only vehicle in its category capable of having child seats installed according to the ISOFIX standard. (ISOFIX is the global standard for child safety seat attachment points.)

The Focus is recognized for its advanced design security and vehicle dynamics. In addition to an ultra-rigid safety cell protected by crumple zones, its arsenal includes dual airbags, front safety belts with a pretensioned limiter, and anti-lock brakes with electronic brake distribution and cornering brake control.

In 2014, we improved all of our primary quality measures in the region.<sup>2</sup> Customer satisfaction was 68 percent, up 3 percentage points compared with 2013, and full-year “things gone wrong” (TGW) was 1,472 per 1,000 vehicles, compared with 1,723 in 2013, a 15 percent improvement. Sales satisfaction with dealer or retailer improved by 3 points compared with 2013, and warranty spending decreased by 11.6 percent in that time.

We have been recognized for the high quality of our vehicles. For example, the Ford Transit was awarded Best Pickup/Utility Launch 2015 by *World Transport* magazine. This award is based on product quality, including its technology, environmental care and other features.

#### READ MORE:

We are relentless in our efforts to improve product quality in all of our regions.

> [Customer Satisfaction and Quality](#)

Ford has a long history of developing and implementing new innovations that improve the safety performance of our vehicles.

> [Vehicle Safety and Accident Avoidance](#)

*The Ford EcoSport and Focus are the first vehicles produced in South America to earn a five-star safety ranking from the Latin NCAP.*

*In 2014, we improved all of our primary quality measures in the region.<sup>2</sup>*

1. Several public and private agencies around the world perform crash testing of vehicles and publish safety

ratings, however these rating systems are relatively new in South America. The Latin NCAP (New Car Assessment Program) began providing ratings on vehicles in South and Central America in 2010. It was developed by Global NCAP, a new nonprofit organization that is promoting the establishment of NCAPs around the world. The most recent test results for Ford vehicles are from November 2013. The Latin NCAP does not test all vehicles each year.

2. Things Gone Wrong, customer satisfaction and warranty spending data are based on model years; sales and service satisfaction data are based on calendar years.

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indirect. In 2015, Ford intends to participate in training sessions in Brazil, China and Mexico with the AIAG and in South Africa with CSR Europe. We also plan to conduct a Ford-sponsored training in Thailand.

## Building Internal Capability

We strongly believe it is important to develop not only supplier capability on these important, developing issues of supply chain sustainability, but also our internal capability. In 2014, we trained 175 new Ford Purchasing employees on supply chain sustainability fundamentals. We also provided training to our global Supplier Technical Assistance (STA) team on the basics of our human rights and working conditions program, as these personnel interact with our supplier plants on a regular basis. The STA training reached almost 1,400 individuals globally. In 2015, we have plans to train the broader Ford Purchasing community.

### READ MORE:

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*Read a discussion of our global commitment to supply chain sustainability and detail on the status of our working conditions assessments.*

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Ford South America

# Our People

Our employees are the drivers behind our successes, and our current manufacturing expansion is the fastest and strongest in 50 years. As we continue to witness surging global demand for our products, we rely ever more deeply on the skills and talents of our dedicated workforce of some 187,000 individuals.

Our employees are crucial to delivering our vision of building great products that contribute to a better world. As such, Ford has maintained a strong focus on employee development – including significant learning opportunities and leadership development as well as diversity and inclusion initiatives to embrace the different perspectives and value of our global employee base.

*Ford maintains a strong focus on employee development.*

## Health and Safety

We marked the fourth consecutive year of zero fatalities among Ford employees in 2014. However, there were four fatalities among contractors who were involved in construction projects at our facilities. Two of these fatalities occurred in South America – one in Brazil and one in Argentina. As a result, we are continuing to emphasize changing the safety culture not only of our own employees, but also that of the thousands of contractors and vendors we hire to clean our facilities, remove trash and scraps, cook meals in cafeterias and maintain equipment, among other outsourced tasks.

Our South American operations have taken strong leadership in promoting the health of the workforce with a unique approach. In 2013, South America launched health promotion efforts by defining four health pillars:

- Movement
- Good nutrition
- Disease Prevention
- Substance-free living

Each country in the region has developed different initiatives that align with these pillars, based on local conditions and concerns. Some standard initiatives have also been implemented across the region, including designating all facilities, buildings and plants as smoke-free. This was achieved through collaboration and engagement with both salaried and hourly employees and our South American union partners.

*Each country in the region has developed health initiatives for their employees based on four pillars of good health.*

The reach of these initiatives goes beyond our employees to the families and communities of our employees. For example, nutrition initiatives are targeted at the entire household, as involvement of the entire family is needed to support success. In addition, we reach out to the community to involve them in

disease prevention efforts.

## Diversity

Serving a global customer base requires employees with different viewpoints and perspectives, all working together as members of a skilled and motivated team. So we are committed to promoting and supporting a diverse and inclusive workforce.

We especially need talented women to develop and market our vehicles if we want to reach this demographic. We have a range of programs to encourage and support women in our workforce. For example, in Argentina we launched a new leadership development program focused on developing more women in leadership positions in the region.

### READ MORE:

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*Read more about how we support our people in all of our regions.*

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and sewing workshops to participate in the production process.

We also created an Environmental Education Center near the Camaçari plant, with programs that seek to educate students on environmental issues in a fun and practical way and help them have a more conscious ecological attitude. Schools visit the center every week, and students participate in workshops with different themes: garden, seedling production, planting trees, worm farm, composting, selective collection, recycling and sustainability, among others. Center employees also go to participating schools to help students create on-site gardens. The project has the support of the Camaçari Department of Education.

In Argentina, we continued a school-building program begun by Ford dealers in 1968. As part of this program, we have rebuilt 21 school buildings originally built by Ford Argentina and its dealers between 1968 and 1982. In 2015, we also celebrated the 50th anniversary of the Henry Ford Technical School, which was founded on April 6, 1965, by Ford Motor Argentina and is located at the Pacheco Industrial Center. The school has 210 students currently attending classes and 1,188 graduates. It is open to boys and girls from the community. Approximately 100 graduates of the school are currently working at Ford Argentina – as trainees, full-time employees, managers and even directors.

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*In Argentina, we continued a school-building program begun by Ford dealers in 1968.*

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Also in Argentina we supported three major educational programs in conjunction with local nonprofits. We supported anti-bullying workshops for 5,500 pupils from 56 elementary schools; we helped 30 vulnerable high school students with economic and social support so they could continue their studies; and we supported university scholarships for low-income students.

## **Ford's Global Week of Caring**

As part of our 2014 Global Week of Caring, Ford employees volunteered their time to benefit the region, including in the following ways:

- Ford Argentina organized a day of volunteering work with the Food Bank Foundation of Buenos Aires. The volunteers dedicated three hours of work, during which they sorted 500 kg of food, enough to make 3,000 meals.
- Also in Argentina, 15 employees collaborated with the blood bank of Municipal Hospital of Tigre City in Buenos Aires as part of a blood drive.
- More than 35 employees in Argentina helped build houses for low-income families, working with Habitat for Humanity and Techo, a local nonprofit.
- Ford Argentina employees worked with Agua y Juventud a local nonprofit, to install pipelines, tanks and pumps to provide drinkable water for poor communities.
- In Brazil, Ford employees helped refurbish an education center run by the Projeto Meninos e Meninas de Rua organization in São Bernardo do Campo. This local nonprofit helps children and adolescents living on the streets.
- Ford Brazil volunteers also helped refurbish facilities at two other Brazilian educational nonprofits: the Creche Emanue, which serves about 50 children in the Camaçari area, and Lar Donato Flores, which focuses on professional training for teenage girls in Tatui.
- Ford employees also volunteered at the Associação para Síndrome de Down.
- Ford Venezuela opened its gates for 50 children as part of a “Conduciendo nuestro

vision para nuestro future” program, which helps children understand the benefits of a decent and honest job and seeks to instill pride in one’s work. The program included a meeting with Ford Andina President Hector Perez, discussions with other employees, drug use prevention tips, recreational activities and distribution of backpacks with school supplies.

**READ MORE:**

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*We are engaging with and investing  
in our communities across the globe.*

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# Ford Middle East and Africa

In 2014, Ford established a new Middle East and Africa (MEA) business unit, which brings together the company's automotive business in 67 markets in North Africa, Sub-Saharan Africa, Southern Africa and the Middle East.

Though we have just formed this business unit, we have a long history in these markets, selling vehicles here for 90 years. Our MEA operations include two manufacturing plants and employ approximately 3,500 people in the region.

Our MEA operations employ approximately

# 3,500

people in the region.

## Performance Highlights

- Formed new business unit for the Middle East and Africa in 2014.
- Announced plans to launch 25 vehicles in the region – including 17 in South Africa and Sub-Saharan Africa – by 2016, including the Ford Fusion, Focus and Mustang.
- Announced we will accelerate the rollout of technologies that enhance the sustainability of our vehicles, including the fuel-efficient EcoBoost® range of engines, SYNC® in-car connectivity, and vehicle safety technologies such as inflatable rear seat belts, MyKey® and other driver assist technologies.
- At Ford's Silverton Plant in South Africa, implemented major water recycling initiatives and are now recycling about five times more water than in previous years, increasing recycled water from 7 percent to 40 percent.
- Implemented 20 community investment projects in the region as part of our 2014 Global Week of Caring program.

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Ford Middle East and Africa

# Welcome

“ A century ago Henry Ford had a vision to open the highways to all mankind. By establishing a new business unit for the Middle East and Africa region, we are seeking to tap the innovation and imagination that’s flourishing here, helping us to bring our founder’s vision to this part of the world.

This is a rapidly changing, fast-growth market. The total Middle East and Africa car market is expected to grow 40 percent by the end of the decade, to 5.5 million vehicles. The Middle East and Africa is the final frontier for global automotive growth, and we are putting the infrastructure and people in place to participate in this growth.

To meet new customer demand, we have pledged to launch 25 vehicles in the region by 2016. The Middle East and Africa region spans from Saudi Arabia to South Africa and from Nigeria to Kenya, so customer tastes are as diverse as our markets. Thanks to our One Ford plan, we can offer vehicles and technology that customers want and value, tailored to the needs of our markets.

*“Our intention is to grow the Ford business while staying true to our principles of being active and supportive members of the community in the Middle East and Africa.”*

As we accelerate the introduction of our new products in the Middle East and Africa, we are building a full family of vehicles offering the very best quality, fuel efficiency, safety, smart design and value. We are also expanding our rollout of technologies that enhance the sustainability of our vehicles and build toward our vision for new mobility. For example, we are implementing fuel-efficient EcoBoost® engines, SYNC® in-car connectivity, and vehicle safety technologies such as inflatable rear seat belts, MyKey® and other driver assist technologies.

Our intention is to grow Ford's business here while staying true to our principles of being active and supportive members of the communities and the future of the Middle East and Africa region.”

### Jim Benintende

President, Ford Middle East and Africa



**Jim Benintende**  
President, Ford Middle East and Africa

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Ford Middle East and Africa

# Mobility

Changing times are creating exciting new opportunities for our business. At Ford, we're not just about making vehicles. We're focused on innovative, sustainable solutions for future global mobility. We're leveraging our people, products and supplier partners to deliver mobility solutions.

Around the world, we are beginning to act on our Blueprint for Mobility – our multi-decade plan for helping to develop better ways to move people and goods and thereby create a better world. In early 2015, we announced Ford Smart Mobility, which is using innovation to take Ford to the next level in connectivity, mobility, autonomous vehicles, big data and the customer experience. As the first step, in 2014 we kicked off mobility experiments around the globe – all designed to test new mobility concepts and evaluate their impact on the environment, while creating value for our business at the same time. We are also hosting a global Innovate Mobility Challenge series, an open-innovation approach to discovering mobility solutions around the world.

We are at the early stages of our mobility journey in the Middle East and Africa. But we do have one mobility innovation challenge in the region. In Johannesburg, South Africa, we offered a challenge focused on adding value to vehicles, especially commercial vehicles, by creating innovative accessories that increase a vehicle's utility. The winner of the challenge – Derek Tabor from the United States, with his Secondary Power Management System proposes constructing an electrical system independent of the primary system already available in the vehicle. It enables multiple devices to be charged – such as lights, communications and refrigeration equipment, computers and more – while allowing the vehicle to operate regardless of the increased electrical draw.

*Blueprint for Mobility is our multi-decade plan for helping to develop better ways to move people and goods.*

### READ MORE:

Read more about our efforts to reshape mobility.

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Ford Middle East and Africa

# Climate Change and Environment

At Ford, we have been working for many years to reduce the environmental impacts of our vehicles and operations.

For example, we recognize the risks and opportunities climate change poses, and we are committed to doing our share to prevent or reduce potential harm due to climate change. To make good on this commitment, we have analyzed what “doing our share” means according to the science of climate change.

We set emission reduction goals for our products by region and manufacturing operations based on stabilizing the atmospheric concentration of carbon dioxide (CO<sub>2</sub>) at 450 parts per million (ppm), the level that many scientists, businesses and governmental agencies believe may avoid the most serious effects of climate change. We are on track to meet the central elements of our strategy.

For each of our new or significantly refreshed vehicles, we offer a powertrain with leading fuel economy, and we are reducing greenhouse gas emissions across our global product portfolio. Also, we are on track to meet our goals to reduce our facility CO<sub>2</sub> emissions by 30 percent from 2010 to 2025 on a per-vehicle basis, and our average energy consumed per vehicle by 25 percent from 2011 to 2016 globally.

## Vehicles

In line with our global strategy, we continue to expand the number of vehicles equipped with our EcoBoost® range of engines, from 1.0L to 3.5L. In 2014 and early 2015, we are expanding EcoBoost engines across a selection of our vehicles in the region, from the Ford Fiesta to the Expedition.

## Sustainable Manufacturing

We have five-year sustainable manufacturing strategies for water, landfill waste and emissions. The ambitious targets embedded in these strategies would see the average Ford vehicle using 30 percent less water and creating 70 percent less waste to landfill in manufacturing over the next five years.

As part of this strategy, Ford’s Silverton plant in South Africa implemented major water recycling initiatives and is now recycling more than five times more water than in previous years, increasing recycled water from 7 percent to 40 percent.

**READ MORE:**

*We have a rigorous and holistic approach to reducing the overall environmental impacts of our*

*We are on track to meet the central elements of our strategy and are reducing GHG emissions across our global product portfolio.*

**OUR PERFORMANCE**

Water recycling

↑ **5x**  
**more**

water recycled in our Silverton manufacturing plant in South Africa than in previous years.

*vehicles and facilities across the globe.*

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## Ford Middle East and Africa

# Product Quality and Safety

At Ford, we design and manufacture vehicles that achieve high levels of quality and vehicle safety for a wide range of people over a broad spectrum of real-world conditions.

In 2014, in the Middle East and Africa region, three of our key measures of vehicle quality improved compared to 2013:

- Full-year “things gone wrong” (TGW) was 1,046 per 1,000 vehicles, compared with 1,311 in 2013, a 20 percent improvement.
- Warranty spending decreased by 5.6 percent compared to 2013.
- Sales satisfaction with dealer or retailer improved 2 points from 2013 to 2014. Service satisfaction with dealer or retailer was unchanged in that time.<sup>1</sup>

Across North Africa and the Middle East there is an increasing emphasis on raising vehicle safety standards. Governments in the region are both planning and implementing regulations to raise vehicle standards.

## Encouraging Safer Driving

Driver behavior is a key contributing factor in many vehicle crashes.<sup>2</sup> We at Ford have developed and support an array of programs and technologies that help to encourage safer behavior on the roadways, for both experienced and novice drivers.

In many Middle Eastern and African markets the number of people of all ages who are driving a car for the first time is increasing rapidly, and the percentage of first-time drivers is higher than in more developed countries. In these markets, therefore, Ford Driving Skills for Life (Ford DSFL) – our premier driver education program – is aimed at novice drivers of all ages.

In the Middle East and Africa region, we launched Ford DSFL in 2012 in Dubai, United Arab Emirates, and we expanded it to Saudi Arabia in 2014. In 2015, we plan to expand the program to Oman, Bahrain and Qatar, and within the United Arab Emirates.

*Our Ford Driving Skills for Life program is aimed at novice drivers of all ages.*

### READ MORE:

We are relentless in our efforts to improve product quality in all of our regions.

> [Customer Satisfaction and Quality](#)

Ford has a long history of developing and implementing new innovations that improve the safety performance of our vehicles.

> [Vehicle Safety and Accident Avoidance](#)

1. Middle East data is based on the following countries: Saudi Arabia, Kuwait, United Arab Emirates, Oman,

Bahrain, Qatar, Jordan, Iraq, Lebanon and Afghanistan. Middle East data does not include South Africa.

2. U.S. Department of Transportation, National Highway Traffic Safety Administration, *National Motor Vehicle Crash Causation Survey: Report to Congress* (Washington, DC: U.S. DOT, July 2008).

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Ford Middle East and Africa

# Supply Chain

The automotive supply chain is one of the most complicated of any industry. Automakers like Ford rely on thousands of suppliers to provide the materials, parts and services necessary to make our final products. We promote long-term relationships with our suppliers and seek alignment with them on sustainability-related issues such as human rights, working conditions, conflict minerals and environmental responsibility.

The basis of our work with suppliers is the Ford Code of Human Rights, Basic Working Conditions and Corporate Responsibility, which applies to our own operations as well as our \$100 billion supply chain. The Code addresses workplace issues such as working hours, child labor and forced labor, as well as nondiscrimination, freedom of association, health and safety, the environment and other issues.

We work to ensure that Ford and our suppliers have management systems in place to mitigate potential risks, ensure continuity of supply and improve the overall sustainability of the complex global automotive supply chain. Our aim is to leverage our supply chain – and our industry – to make a positive impact in the markets in which we do business.

*With our suppliers, we seek to make a positive impact in the markets in which we do business.*

## Our Approach

Our goals to control costs, improve quality and meet sustainability targets require an unprecedented level of strong relationships and shared commitments with our suppliers. We proactively engage our supplier partners to develop a sustainable supply chain. Specifically, we:

1. Communicate our expectations to our suppliers
2. Assess our suppliers for environmental and social performance
3. Build our suppliers' environmental and social capability
4. Collaborate with industry and cross-industry organizations to develop common solutions in a noncompetitive environment

## Training for Suppliers

Since 2007, Ford has led or participated in supplier human rights training sessions in Argentina, Brazil, China, India, Mexico, Romania, Russia, Thailand, Turkey and Venezuela. In 2014, we held joint industry trainings through the Automotive Industry Action Group (AIAG) in Russia and conducted independent Ford training sessions in Brazil, China, India, Mexico and Turkey. Overall, we trained more than 280 Ford suppliers – both direct and indirect. In 2015, Ford intends to participate in training sessions in Brazil, China and Mexico with the AIAG and in South Africa with CSR Europe. We also plan to conduct a

Ford-sponsored training in Thailand.

## Building Internal Capability

We strongly believe it is important to develop not only supplier capability on these important, developing issues of supply chain sustainability, but also our internal capability. In 2014, we trained 175 new Ford Purchasing employees on supply chain sustainability fundamentals. We also provided training to our global Supplier Technical Assistance (STA) team on the basics of our human rights and working conditions program, as these personnel interact with our supplier plants on a regular basis. STA training reached almost 1,400 individuals globally. In 2015, we have plans to train the broader Ford Purchasing community.

### READ MORE:

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*We have made a global commitment to supply chain sustainability.*

> [Supply Chain](#)

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*Read more about the status of our working conditions assessments.*

> [Human Rights and Working Conditions in Our Supply Chain](#)

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Ford Middle East and Africa

# Our People

Our employees are crucial to delivering our vision of building great products that contribute to a better world.

As such, Ford has maintained a strong focus on employee development – including significant learning opportunities, leadership development, as well as diversity and inclusion initiatives to embrace the different perspectives and value of the global employee base.

*Ford maintains a strong focus on employee development.*

The head office of Ford Middle East and Africa (MEA) is based in the Dubai Emirate in the United Arab Emirates, which provides an ideal location given its access to the rest of MEA. Dubai also provides us with one of the most diverse workforces in the world. As of early 2015, for example, our Dubai offices employed more than 100 people from 20 different nationalities. This provides Ford with the skills and diversity to support growth in the MEA region.

### READ MORE:

Read more about how we support our people in all of our regions.

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- In Ghana, Ford employees helped to build water wells at a school for deaf children, improving access to clean water.
- In Nigeria, Ford volunteers supported efforts to improve waste management in local communities, including donating waste bins. We also volunteered at local schools to rehabilitate classroom blocks, provide and repair classroom chairs and desks, and provide books, stationery and other writing materials, to help create a healthy educational environment.
- In South Africa, Ford volunteers participated in multiple projects, many focused on providing access to clean water or improving facilities at and donating supplies to local community centers, soup kitchens, schools and nursing homes. Employees also renovated and converted five shipping containers to provide housing for 10 families in Booyens Park within the Vastrap Community. The project took three weeks to complete and was the result of thousands of man-hours and countless Ford volunteers dedicating their time and skills to transforming these containers into safe and secure housing units.

#### READ MORE:

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*We are engaging with and investing  
in our communities across the globe.*

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# About This Report

Welcome to Ford’s 16th annual report on our sustainability progress. At Ford, we see reporting as an ongoing, evolving process, not an annual exercise. We expect our reporting to evolve further still and invite your feedback on this Report, as well as our approach to reporting, at [sustaina@ford.com](mailto:sustaina@ford.com).

On this page:

- ↓ Stakeholder Review of Report
- ↓ Data Assurance

This Report covers the year 2014 and early 2015. The data are primarily for 2014 (for operations) and for the 2014 and 2015 model years (for vehicles). In addition to this full online Report, we publish an eight-page [summary report](#) for use by employees, customers and other stakeholders. Our most recent previous report was released in June 2014.

Data in this Report are subject to various forms of [assurance](#) as discussed below and noted in the data tables. The summary report was reviewed by Ford’s top executives and the Sustainability and Innovation Committee of the Board of Directors.

This Report is in accordance with the Global Reporting Initiative (GRI) G4 Sustainability Reporting Guidelines at the Comprehensive level. See the [GRI Content Index](#) for a complete listing of the GRI indicators. More information on the GRI Guidelines can be found on the [GRI website](#).

This Report also serves as Ford’s annual United Nations Global Compact (UNGC) “Communication on Progress,” as it includes discussion of Ford’s implementation of the 10 principles of the UNGC and support for broad U.N. development goals. Please see the [UNGC Index](#) for information on where the UNGC principles are covered in this Report.

Consistent with the GRI Guidelines’ guidance on boundary setting, the data in this Report cover all of Ford Motor Company’s wholly and majority-owned operations globally, unless otherwise noted. Boundaries for each material issues are noted in the [materiality analysis](#) section. Data measurement techniques, the bases of calculations, changes in the basis for reporting, or reclassifications of data previously reported are noted in the data charts.

## Stakeholder Review of Report

For this Sustainability Report and our previous eight reports, [Ceres](#) convened Stakeholder Committees to advise us. Ceres leads a national coalition of investors, environmental organizations and other public interest groups working with companies to address sustainability challenges. Ford agreed to work with a stakeholder team that was selected for us by Ceres. The Ceres Stakeholder Committee that was convened is an independent group of individuals drawn primarily from the Ceres coalition and representing a range of constituencies that have expertise in environmental, social and governance issues.

The Committee reviewed past reports, the draft materiality matrix and the outline for this 2014/15 Sustainability Report. The Committee met once by teleconference, and some

members provided input to Ceres outside of the meeting.

The Committee provided a range of recommendations, including the following:<sup>1</sup>

- Describe mobility in the context of both sustainability and business strategy and connect it to Ford's climate change goal.
- Publicly support climate change mitigation policies.
- Discuss how progress toward Ford's climate goal and glide paths is assessed.
- Set renewable energy production goals.
- Use the *UN Guiding Principles Reporting Framework* for human rights in the supply chain.
- Encourage supplier sustainability goal setting.
- Disclose more information about supplier performance on assessments.
- Set additional product quality and safety goals.
- Adjust the position of several issues in the materiality matrix and thoroughly document the materiality analysis process.
- Discuss data privacy, cybersecurity and other concerns associated with technology and wireless connectivity.
- Discuss electromagnetic fields generated by vehicle components and technologies.

## Ford Actions in this Report

We responded to Committee recommendations in a number of ways, including the following:

- The importance of innovative mobility solutions to Ford's sustainability and business strategies is expressed in a variety of places in this Report. "Global Mobility through Changing Times" is the theme of the Report and one of the themes of the joint letter from the CEO and the executive chairman. We have included a top-level section on mobility that discusses Ford's strategy and how it responds to global megatrends, including climate change, resource scarcity and air pollution.
- The process for assessing [progress toward Ford's climate change goal](#) is discussed in the Climate Change section.
- We adjusted the position of several issues – mobility innovation, financial health and dealer relationships – in the [materiality matrix](#) to reflect the level of stakeholder interest in those topics and provided additional detail on the [materiality process](#) and the role of "megatrend amplifiers" in identifying and prioritizing material issues.
- This report includes new information on [data privacy](#) and [electromagnetic fields](#), as well as a first-person "voice" from [Ford's global chief data and analytics officer](#).
- The supply chain section includes expanded data about supplier performance on assessments.

Recommendations that were not responded to in this report will be considered for future reporting and treated as an input to our materiality analysis process.

## Data Assurance

Some of the data in our reports have been subject to various forms of internal and third-party verification, as follows:

- Financial data were audited for disclosure in the Ford Annual Report on [Form 10-K](#).
- Verification data is not yet available for Ford's 2014 global facility greenhouse gas (GHG) emissions. One hundred percent of Ford's 2013 global facility GHG emissions are third-party verified to limited assurance. Seventy-three percent of Ford's 2013 global facility GHG emissions are third-party verified to a reasonable level of

assurance. In addition, all of our European facilities impacted by the mandatory EU Emissions Trading Scheme (EU-ETS) are third-party verified. All EU-ETS verification statements are provided to Ford, by facility, from Lucideon (formerly CICS) for U.K. facilities, Lloyds for Spain, Intechnica for Germany and SGS for Belgium. North American facilities are verified against the Climate Registry's General Reporting Protocol. European facilities are verified against the EU-ETS rules and guidelines.

- Ford voluntarily reports facility carbon dioxide emissions to national emissions registries or other authorities in the U.S., Canada, Mexico, Argentina, Australia, Brazil, China and Taiwan.
- Various environmental data are reported to regulatory authorities.
- Ford's facility environmental data are managed using our Global Emissions Manager database, which provides a globally consistent approach to measurement and monitoring.

The kind of assurance used for each data set is noted in the data charts.

- 
1. This synopsis draws from a summary of the stakeholder engagement process prepared by Ceres; however, it does not cover every point raised and was not reviewed by the participating stakeholders. The engagement was conducted under Chatham House Rules. Therefore we are not able to attribute recommendations to specific stakeholders as that information is confidential.

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Letter from Kim Pittel

Map of Our Year

Performance Summary

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∨ Ford Around the World

About This Report

> **GRI Content Index**

UNGC Index

# GRI Content Index

This Report is 'In Accordance' with the Global Reporting Initiative's (GRI) G4 Guidelines – Comprehensive option. Please download our full GRI Content Index for a listing of the GRI indicators and our responses.

For a detailed explanation of the indicators, visit the [GRI website](#).

 [Download GRI Content Index](#) (pdf, 1.15Mb)

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## UNGC Index

In 2008 Ford joined the United Nations Global Compact, which endorses a framework of principles in the areas of human rights, labor and the environment. We continue to be committed to the principles and are actively implementing them as detailed in this report.



**Mark Fields**  
President and Chief Executive Officer

## Human Rights

UNGC Principle	Report Links
1. Businesses should support and respect the protection of internationally proclaimed human rights.	<ul style="list-style-type: none"> <li>&gt; <a href="#">Policy Letters and Directives</a></li> <li>&gt; <a href="#">Ethical Business Practices</a></li> <li>&gt; <a href="#">Human Capital Management</a></li> <li>&gt; <a href="#">Community Engagement and Investment</a></li> </ul>
2. Businesses should make sure that they are not complicit in human rights abuses.	<ul style="list-style-type: none"> <li>&gt; <a href="#">Policy Letters and Directives</a></li> <li>&gt; <a href="#">Human Capital Management</a></li> <li>&gt; <a href="#">Human Rights and Working Conditions in Our Supply Chain</a></li> <li>&gt; <a href="#">Conflict Minerals in Our Supply Chain</a></li> </ul>

## Labor Standards

UNGC Principle	Report Links
3. Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining.	<ul style="list-style-type: none"> <li>&gt; <a href="#">Working at Ford – Employees</a></li> <li>&gt; <a href="#">Policy Letters and Directives</a></li> <li>&gt; <a href="#">Human Capital Management</a></li> </ul>
4. Businesses should uphold the elimination of all forms of forced and compulsory labor.	<ul style="list-style-type: none"> <li>&gt; <a href="#">Policy Letters and Directives</a></li> <li>&gt; <a href="#">Community Engagement and Investment</a></li> <li>&gt; <a href="#">Human Rights and Working Conditions in Our Supply Chain</a></li> </ul>
5. Businesses should uphold the effective abolition of child labor.	<ul style="list-style-type: none"> <li>&gt; <a href="#">Policy Letters and Directives</a></li> <li>&gt; <a href="#">Community Engagement and Investment</a></li> <li>&gt; <a href="#">Human Rights and Working Conditions in Our Supply Chain</a></li> </ul>
6. Businesses should uphold the elimination of discrimination in	<ul style="list-style-type: none"> <li>&gt; <a href="#">Policy Letters and Directives</a></li> </ul>

respect of employment and occupation.

- > [Human Capital Management](#)
- > [Policies and Grievance Procedures](#)
- > [Our Vision and Strategic Areas of Focus](#)
- > [Supplier Diversity](#)

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## Environment

UNGC Principle	Report Links
7. Businesses should support a precautionary approach to environmental challenges.	<ul style="list-style-type: none"><li>&gt; <a href="#">Climate Change</a></li><li>&gt; <a href="#">Climate Change Risks and Opportunities</a></li></ul> <p>Notes: 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. In addition, we assess and manage environmental, safety, supply chain, operational and other risks as described throughout this report.</p>
8. Businesses should undertake initiatives to promote greater environmental responsibility.	<ul style="list-style-type: none"><li>&gt; <a href="#">Policy Letters and Directives</a></li><li>&gt; <a href="#">Climate Change</a></li><li>&gt; <a href="#">Greening Our Operations</a></li><li>&gt; <a href="#">Greening Our Products</a></li><li>&gt; <a href="#">Sustainable Materials</a></li><li>&gt; <a href="#">Water</a></li><li>&gt; <a href="#">Spotlight: Reinventing the Ford F-150</a></li></ul>
9. Businesses should encourage the development and diffusion of environmentally friendly technologies.	<ul style="list-style-type: none"><li>&gt; <a href="#">Greening Our Operations</a></li><li>&gt; <a href="#">Greening Our Products</a></li><li>&gt; <a href="#">Sustainable Materials</a></li><li>&gt; <a href="#">Sustainable Technologies and Alternative Fuels Plan</a></li><li>&gt; <a href="#">Vehicle Fuel Efficiency and CO<sub>2</sub> Emissions Progress and Performance</a></li></ul>

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## Anti-Corruption

UNGC Principle	Report Links
10. Businesses should work against corruption in all its forms, including extortion and bribery.	<ul style="list-style-type: none"><li>&gt; <a href="#">Ethical Business Practices</a></li><li>&gt; <a href="#">Policy Letters and Directives</a></li></ul>

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# Strategy and Governance

Our sustainability strategy is embedded in our One Ford business plan and consistent with our aim to deliver Great Products, a Strong Business and a Better World.



### GLOBAL MEGATRENDS

We focus on the impacts of global megatrends on our people, our operations and the communities in which we work.

> [Global Megatrends](#)

### STRATEGY

Learn more about our business strategy and our sustainability strategy and how we have aligned them to drive sustainability performance.

- > [Business Strategy](#)
- > [Sustainability Strategy](#)



*In 2015, Ford was honored by the Ethisphere Institute as one of the World's Most Ethical Companies.*

> [Sustainability Governance](#)



*We identify our most significant sustainability issues and use them to focus our strategy and reporting.*

> [Materiality Analysis](#)



*As a major multinational enterprise, our activities have far-reaching environmental, social and economic impacts.*

> [Our Value Chain and Its Impacts](#)

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# Business Strategy

Ford’s vision, articulated in our Creating Value Roadmap, is “people working together as a lean, global enterprise for automotive leadership.” Automotive leadership is measured by the satisfaction of our customers, employees, investors, dealers, suppliers and communities.

We work toward our vision by building:

- Great Products, a full family of vehicles – small, medium and large; cars, utilities and trucks – with best-in-class quality, fuel efficiency, safety and smart design;
- Strong Business, based on a balanced portfolio of products and global presence; and
- Better World, accomplished through our sustainability strategy.

## Our Strategic Priorities

We are focused on our three strategic priorities: accelerating the pace of progress of our One Ford plan; delivering product excellence with passion; and driving innovation in every part of our business.

## Accelerate the Pace of Progress

The One Ford plan has been fundamental to the progress we have made in recent years, and it is fundamental to our performance going forward. In many ways we are starting to see the full benefits and strength of the One Ford plan, and we see an opportunity to accelerate our pace of progress to drive operational excellence and profitable growth for all.



# ONE FORD

ONE TEAM • ONE PLAN • ONE GOAL

## ONE TEAM

People working together as a lean, global enterprise for automotive leadership, as measured by:

*Customer, Employee, Dealer, Investor, Supplier, Union/Council, and Community Satisfaction*

## ONE PLAN

- Aggressively restructure to operate profitably at the current demand and changing model mix
- Accelerate development of new products our customers want and value
- Finance our plan and improve our balance sheet
- Work together effectively as one team

## ONE GOAL

An exciting viable Ford delivering profitable growth for all

## Deliver Product Excellence with Passion

Our second priority is to deliver product excellence with passion. Products are the lifeblood of our business, and our One Ford plan has allowed us to field the best product lineup we have ever had – and one of the freshest.

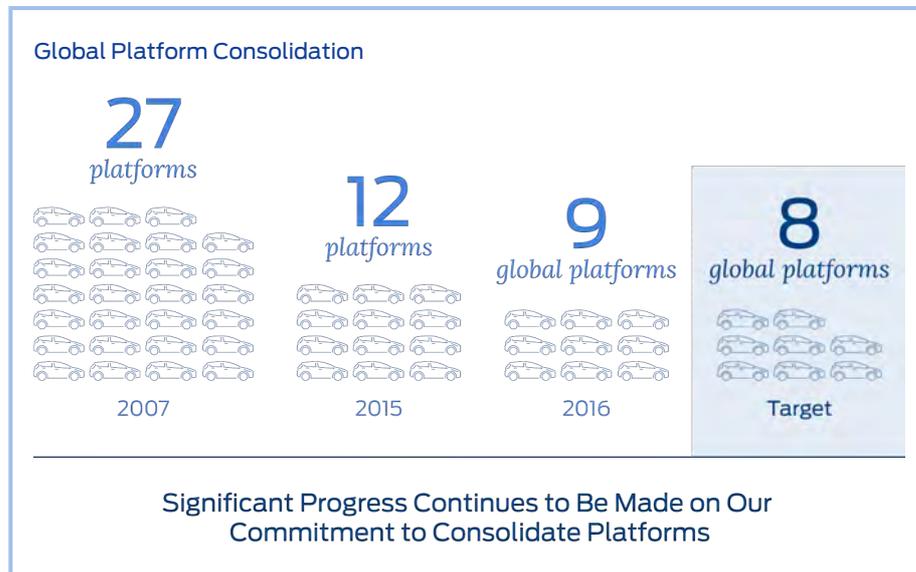
In 2014, we launched 24 all-new or significantly refreshed products globally, including the all-new Ford F-150, Mustang, Escort, Ka and Transit and the Lincoln MKC. Our momentum will continue in 2015 with 15 new global product launches. Our strategy is to serve customers in all markets with a full family of best-in-class vehicles – small, medium and large; cars, utilities and trucks; each delivering the highest quality, fuel efficiency, safety, smart design and value – and to deliver profitable growth for all.

### Global Product Lineup



Our One Ford global product development process utilizes global platforms to deliver customer-focused programs rapidly and efficiently across global markets. We continue to make progress on our commitment to consolidate platforms.

We now have 12 total platforms, and we are on track to have nine global platforms in 2016, with almost 100 percent of our global vehicle volume coming off the nine global platforms. We are able to reinvest the savings resulting from our platform consolidation back into product development, to introduce more products at a faster product cadence; our cumulative refresh rate for the 2015 to 2019 period is expected to be the best in the industry. Over 50 percent of our global volume in 2015 will be from vehicles launched in 2014 and 2015. These launches help set up our next stage of growth, and this will drive revenue and profit growth.

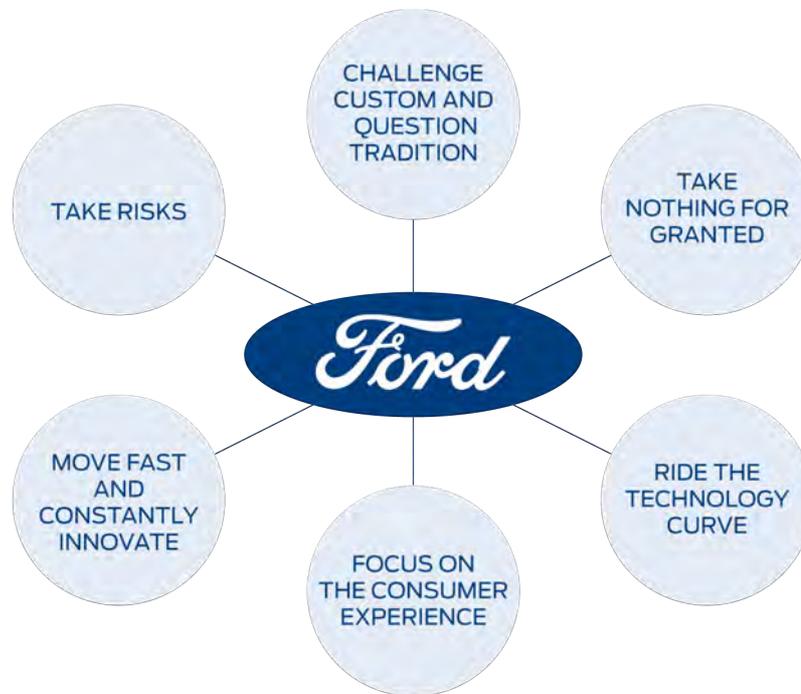


## Drive Innovation in Every Part of Our Business

Our third priority is to drive innovation in every part of our business. Our industry is rapidly evolving, and new technology is having a significant impact on our business.

We are a technology leader, providing innovations that consumers demand today while developing affordable, accessible solutions to help meet the needs of future transportation. Our approach to innovation is to employ an Innovation Mindset – by asking questions, challenging customs and taking intelligent risks – all across the company, in every part of the business. Innovation is driven by individuals and teams that find new ways to approach existing problems in a quest to make the world a better place.

We are always looking ahead and developing affordable, accessible solutions to help meet the needs of future transportation, as discussed in more detail in the [Mobility](#) section.



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**SILICON VALLEY MINDSET**  
Challenge industry norms and take nothing for granted

## Our Focus on Creating Value

The Creating Value Roadmap (CVR) is the process we use to run the company and drive results. It is how we adapt to a constantly changing environment and adjust our plans to keep pace. The CVR process begins with continuous monitoring of risks and opportunities presented by changes in a wide range of factors in the global business environment. This analysis informs development of the company's overall strategy. The strategy drives the business plan, which includes targets and objectives for revenues, other financial indicators and the satisfaction of key stakeholders.

Once the strategy and plan are defined for the year through the CVR process, objectives are set for business units, functions and individuals, tied to the overall company plan objectives and further defined through deliverables and metrics. We monitor progress against objectives throughout the year, using the [Business Plan Review and Special Attention Review](#) processes. This allows us to make adjustments in a timely way and respond to new internal and external developments.

After serving us well for several years, the CVR process was institutionalized as a Policy Letter – only the 25th such policy in the company's 112-year history.

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# Sustainability Strategy

At Ford, we define sustainability as a business model that creates value consistent with the long-term preservation and enhancement of environmental, social and financial capital. Our sustainability strategy is embedded in our One Ford business plan and consistent with our aim to deliver Great Products, a Strong Business and a Better World.

Key elements of our sustainability strategy that address our material issues include the following:

- Our [science-based climate strategy](#) is based on what needs to happen in the world – the stabilization of greenhouse gases in the atmosphere. We have translated this into an absolute reduction goal that spans our products and facilities.
- Our [Blueprint for Mobility](#) sets out near-, mid- and long-term strategies and plans for Ford’s contribution to sustainable mobility based on an analysis of population growth, urbanization and other key societal and economic trends. Our goal is to make mobility affordable in every sense of the word – economically, environmentally and socially – and to provide seamless mobility for all.
- We have adopted a [comprehensive water strategy](#) that corresponds to the key elements of the CEO Water Mandate and is based on five key platforms designed to effect substantial, sustainable and measurable impacts. Please see the [Water](#) section for details of that strategy and our performance.
- We were the first automaker to recognize that protecting human rights in our operations and our supply chain is an important sustainability issue. We have developed policies and systems to understand and address these human rights and other social and environmental risks throughout our operations. Our human rights strategy includes adherence to our Code of Human Rights, Basic Working Conditions and Corporate Responsibility (Policy Letter 24), in [our own operations](#) and in those of [our suppliers](#).

We take a holistic approach to these and other sustainability issues, recognizing the dynamic nature of the issues and the interconnections between them. Our revamped materiality analysis reflects this understanding by analyzing the megatrends that are driving change, how they connect with our key sustainability issues, and how the trends may affect the issues’ importance in the future.

Our Sustainability, Environmental & Safety Engineering organization oversees sustainability strategy development, integration and implementation by identifying emerging challenges and opportunities and mobilizing resources within the company to address them and help us remain competitive in a changing world. Our business units have set a series of goals and targets related to sustainability and tied to the overall corporate business plan. Like all objectives related to the business plan, progress is monitored

throughout the year so there is timely warning if targets are at risk of not being achieved. When that occurs, steps are identified to get back on track.

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# Financial Health

Ford reported 2014 full-year pre-tax profit, excluding special items, of \$6.3 billion, the company's fifth consecutive year of both profitability and positive Automotive operating-related cash flow. The results were driven by profitability in North America, record results in Asia Pacific, and the highest Ford Credit profit since 2011.

Our investments and a record number of new products launched around the world made 2014 a solid yet challenging year for Ford, but positioned us for strong growth in 2015 and beyond. As a result of our 2014 financial performance, we made profit-sharing payments to approximately 50,000 U.S. hourly employees in the first quarter of 2015. North America pre-tax profits of \$6.9 billion generated profit-sharing payments of approximately \$6,900 per eligible employee on a full-year basis.

Our net income attributable to Ford Motor Company was \$3.2 billion, or \$0.80 per share of Common and Class B Stock, in 2014, a decline of \$4 billion, or \$0.97 per share, from 2013.

**North America** continued to benefit from robust industry sales, our strong product lineup, continued discipline in matching production to demand, and a lean cost structure. North America's full-year wholesale volume and revenue both declined 5 percent compared with 2013. Operating margin was 8.4 percent, 1.8 percentage points lower than 2013, while pre-tax profit was \$6.9 billion, down \$1.9 billion. For the full year, total U.S. market share was down 1 percentage point, primarily reflecting lower F-150 share as we prepared for the all-new vehicle by balancing share with transaction prices and stocks, as well as a planned reduction in daily rental sales.

In **South America**, we are continuing to execute our strategy of expanding our product lineup, including replacing legacy products with global One Ford offerings. We also are continuing to manage the effects of slowing GDP growth, lower industry volumes in our larger markets, weaker currencies, high inflation, as well as policy uncertainty in some countries. Full-year wholesale volume and revenue deteriorated from a year ago by 14 percent and 19 percent, respectively. Operating margin was negative 13.2 percent, and the pre-tax loss was \$1.2 billion, both deteriorated from 2013.

Improvement in **Europe's** 2014 results reflects our continued implementation of our transformation plan focused on product, brand and cost. Europe's full-year wholesale volume and revenue were up 5 percent and 8 percent, respectively, from a year ago. Operating margin was negative 3.6 percent and the pre-tax loss was \$1.1 billion, both improved from 2013. Europe 20 full-year market share, at 8.0 percent, was up 0.2 percentage points, more than explained by a 1.4 percentage point improvement in our commercial vehicle share, to 11.4 percent, reflecting the success of our full line of new Transit vehicles and continued strong performance of the Ranger compact pickup.

In **Middle East and Africa** we are focused on building our distribution capability, expanding our One Ford product offering tailored to the needs of markets in the region, and

leveraging global low-cost sourcing hubs for vehicles in this fast-growing region. Middle East and Africa's full-year wholesale volume and revenue were down 4 percent and 3 percent, respectively, from 2013. Operating margin was negative 0.5 percent and the pre-tax loss was \$20 million, both improved from a year ago.

Our strategy in **Asia Pacific** is to invest in growth through both new and expanded plants, new products and the introduction of Lincoln in China. Wholesale volume improved 13 percent compared with 2013, while revenue, which excludes our China joint ventures, improved 5 percent. Our wholesale volume in China was up 19 percent. Operating margin was 5.5 percent, up 2.3 percentage points, and pre-tax profit was \$589 million, up \$262 million. Our market share in the region was a record 3.5 percent for the full year, up by 0.2 percentage points compared with 2013. The improvement was driven by China, where our market share for the full year rose to a record 4.5 percent, up by 0.4 percentage points compared with 2013, reflecting continued strong sales across our vehicle lineup.

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# Data

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### A. Cumulative Shareholder Five-Year Return

	Base					
	2009	2010	2011	2012	2013	2014
Ford	100	167.90	107.60	131.92	161.37	<b>167.37</b>
S&P 500	100	115.06	117.49	136.30	180.44	<b>205.14</b>

Provided by third party: Standard & Poor's, a division of the McGraw Hill Financial

Data notes and analysis:

Updated data to reflect 2009 base.

For more information, please see Ford's [Annual Report](#) (pdf, 4.3Mb).

Also see:

- [> Financial Health](#)

### B. Financial Operating Highlights

#### Key Metrics

\$ billion, except for percentages

	2013	2014
<b>Automotive</b>		
Revenue	\$139.4	<b>\$135.8</b>
Operating margin <sup>1</sup>	5.4%	<b>3.9%</b>
Operating-related cash flow	\$6.1	<b>\$3.6</b>
<b>Ford Credit</b>		
Pre-tax profit <sup>2</sup>	\$1.8	<b>\$1.9</b>

Total Company		
Pre-tax profit	\$8.6	<b>\$6.3</b>

## Amounts Attributable to Ford Motor Company

	\$ million	
	2013	<b>2014</b>
Net Income	\$7,182	<b>\$3,187</b>

## Cash and Spending

	\$ billion	
	2013	<b>2014</b>
Automotive cash at year end		
Automotive gross cash <sup>3</sup>	\$24.8	<b>\$21.7</b>
- Cash net of Automotive debt	\$9.1	<b>\$7.9</b>
Automotive capital spending	\$6.6	<b>\$7.4</b>

## Shareholder Value

	per share	
	2013	<b>2014</b>
Dividends paid	\$0.40	<b>\$0.50</b>

### Data notes and analysis:

1. Automotive operating margin is defined as Automotive pre-tax results, excluding special items and Other Automotive, divided by Automotive revenue.
2. Excludes special items; reconciliation to GAAP for full-year 2013 and 2014 provided in "Results of Operations" and "Liquidity and Capital Resources" in our 2014 Form 10-K.
3. Automotive gross cash includes cash and cash equivalents and marketable securities, net of any securities-in-transit.

For more information, please see [Ford's 10-K](#) (pdf, 6.5Mb) and [Annual Report](#) (pdf, 4.3Mb).

Also see:

> [Financial Health](#)

## C. Profile of Ford Investors

	Percent		
	2012	2013	<b>2014</b>
Institutional Investors:	51	52	<b>54</b>
Top 15	25	24	<b>27</b>
Others	26	28	<b>27</b>
Employees and Management	7	6	<b>6</b>
Individuals <sup>1</sup>	42	42	<b>40</b>

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Data notes and analysis:

1. The ownership by individuals includes shares owned by the Ford family and by Ford employees and management outside of the Company savings plans.

For more information, please see Ford's [Annual Report](#) (pdf, 4.3Mb).

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Also see:

[> Financial Health](#)

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## D. Worldwide Income Taxes Paid

	\$ million		
	2012	2013	<b>2014</b>
Income taxes paid/(refunded)	344	538	<b>467</b>

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Data notes and analysis:

For additional information regarding income taxes, see [Note 21 of the Notes to the Financial Statements in the 2014 10-K](#) (pdf, 6.5Mb).

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Also see:

[> Financial Health](#)

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# Data: Market Share and Sales

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- B. [Ford Motor Company Market Share – Europe](#)
- C. [Ford Credit Financing Share – United States](#)
- D. [Ford Credit Financing Share – Europe](#)
- E. [Summary of Total Company Wholesale Vehicle Unit Sales](#)

## A. Ford Motor Company Market Share – United States

	2012	2013	2014
			Percent
	15.2	15.7	<b>14.7</b>

Reported to regulatory authorities

Data notes and analysis:

Market share represents reported retail sales of our brands as a percent of total industry sales volume in the relevant market or region. Market share is based, in part, on estimated vehicle registrations; includes medium and heavy trucks.

## B. Ford Motor Company Market Share – Europe

	2012	2013	2014
			Percent
	7.4	7.3	<b>7.2</b>

Reported to regulatory authorities

Data notes and analysis:

Europe 20 market share was 8.0 percent, 7.8 percent, and 7.9 percent in 2014, 2013, and 2012, respectively. Automotive Segments were reorganized effective January 1, 2014. For more information, please see [FS-65 in our 2014 Form 10-K](#) (pdf, 6.5Mb).

Also see:

## C. Ford Credit Financing Share – United States

Percent

	2012	2013	2014
Retail installment and lease	38	40	45
Wholesale	78	77	77

---

 Reported to regulatory authorities

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Data notes and analysis:

These data include Ford and Lincoln vehicles only.

For more information on Ford Credit, please visit [www.fordcredit.com](http://www.fordcredit.com). For more information on Ford Credit financial information, visit the [Ford Credit investor center](#).

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Also see:

> [Ford Motor Credit Company's Community Investments](#)

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## D. Ford Credit Financing Share – Europe

Percent

	2012	2013	2014
Retail installment and lease	32	34	36
Wholesale	98	98	98

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 Reported to regulatory authorities

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Data notes and analysis:

These data include Ford vehicles only.

For more information on Ford Credit, please visit [www.fordcredit.com](http://www.fordcredit.com). For more information on Ford Credit financial information, visit the [Ford Credit investor center](#).

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Also see:

> [Ford Motor Credit Company's Community Investments](#)

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## E. Summary of Total Company Wholesale Vehicle Unit Sales<sup>1,2</sup>

Thousands

2012	2013	2014
5,668	6,330	6,323

 Reported to regulatory authorities

Data notes and analysis:

1. Wholesale unit volumes include sales of medium and heavy trucks.
2. Wholesale unit volumes include all Ford and Lincoln badged units (whether produced by Ford or by an unconsolidated affiliate) that are sold to dealerships, units manufactured by Ford that are sold to other manufacturers, units distributed for other manufacturers, and local brand units produced by our unconsolidated Chinese joint venture Jiangling Motors Corporation, Ltd. ("JMC") that are sold to dealerships. Vehicles sold to daily rental car companies that are subject to a guaranteed repurchase option (i.e., rental repurchase), as well as other sales of finished vehicles for which the recognition of revenue is deferred (e.g., consignments), also are included in wholesale unit volumes. Revenue from certain vehicles in wholesale unit volumes (specifically, Ford badged vehicles produced and distributed by our unconsolidated affiliates, as well as JMC brand vehicles) are not included in our revenue.

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# Data: Innovation

Data on this page:

- A. [U.S. Utility Patents Issued to Ford and Subsidiaries](#)

## A. U.S. Utility Patents Issued to Ford and Subsidiaries

Number of patents issued

	2009	2010	2011	2012	2013	<b>2014</b>
	325	430	444	661	718	<b>817</b>

Data notes and analysis:

Utility patents are patents that cover the useful features of an invention, and these are measures of technological innovation. We have generated a large number of patents related to the operation of our business and expect this portfolio to continue to grow as we actively pursue additional technological innovation. The average age for patents in our active patent portfolio is just under five and a half years.

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# Materiality Analysis

Ford was an early adopter of materiality analysis in the context of sustainability. We published our first materiality analysis 10 years ago in our 2004/2005 Sustainability Report and have updated it every other year since. The analysis has been used to set reporting priorities, identify emerging sustainability issues, shape our sustainability strategy, set goals and allocate resources.

For this report and the transition to Global Reporting Initiative (GRI) G4 reporting, we substantially revised our [materiality analysis process](#) to align with GRI G4 guidance and provide more insight into our key issues based on megatrend analysis.

For the purposes of this report, we consider *material information* to be that which is of greatest interest to, and which has the potential to affect the perception of, those stakeholders who wish to make informed decisions and judgments about the company's commitment to environmental, social and economic progress. This definition predates, but is consistent with, the GRI definition.

### GRI Definition of Material Aspects

Material aspects are those that reflect the organization's significant economic, environmental and social impacts; or that substantively influence the assessments and decisions of stakeholders.

#### READ MORE:



Explore our interactive materiality matrix.

- > [A Closer Look at Our Material Issues](#)

- > [Overview of the Analysis Process](#)
- > [Results of the Materiality Analysis](#)

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# Overview of the Analysis Process

To identify and prioritize Ford’s material issues, we updated the analysis done for our 2012/2013 Sustainability Report using a three-step process:

1. Identification of Material Issues
2. Prioritization of Material Issues
3. Validation and Review of Material Issues

## Identification

As a first step, we developed a list of potential issues curated and grouped by four different types of “capitals” – social, environmental, financial and human – as well as the topic of governance. The issues were identified based on a review of inputs representing the concerns of internal and external [Ford stakeholders](#). The issue identification process also included an analysis of impacts along Ford’s [value chain](#).

## Prioritization

Next, we determined the materiality and priority of each issue based on:

- Its frequency of mention and importance to internal and external stakeholders
- The extent of its impact within Ford’s value chain
- The trend in the complexity and volatility of the issue based on key megatrends we identified

We rated each issue as low, moderate or high for current or potential impact on the company in a three- to 10-year timeframe, as well as degree of concern to stakeholders (by stakeholder group). Though we considered possible impacts and importance out to 10 years, three to five years is the timeframe in which Ford can make meaningful changes in our own actions based on our internal planning and production cycles. For each issue, the ratings were averaged separately for Ford and stakeholders (with extra weight assigned to investors and multi-stakeholder inputs, as they are key audiences of our reporting). The prioritization also gave additional weight to those issues that had multiple impacts across the value chain and affected multiple stakeholder groups.

## Megatrend Amplification

To reflect the dynamic and interrelated nature of the issues, we added a new element to our materiality process this year, incorporating an analysis of sustainability megatrends into the prioritization of material issues. We conducted a review of sustainability megatrends to identify the major external forces shaping Ford’s future and impacting the importance of issues currently and into the future. Megatrends are great forces in societal development that are anticipated to affect all areas – state, market and civil society – for many years to come. Several [megatrends](#) were identified as relevant to the sustainability context for the list of material issues:



### Growing Population



### The World of Opposites:

- Young vs. Old
- Emerging vs. Shrinking Middle Class
- Local vs. Global



### Urbanization



### Resource and Carbon Constraints



### Disruptive Innovation and Big Data

Also see:

> [Global Megatrends](#)

These megatrends were treated as “amplifiers” to the prioritization of material issues. We assumed that the more the issues intersected with megatrends, the more complexity, uncertainty and importance the issues would manifest over time. For example, the issue of mobility is affected by several megatrends, including urbanization, resource constraints, a growing middle class, as well as disruptive innovation and big data. As a result, this issue received greater weight than a material issue that might be similar in importance to Ford and stakeholders but was only influenced by a single megatrend.

## Materiality Matrix

The issues and their ratings were then plotted on a materiality matrix. The y-axis represents concern to stakeholders increasing from bottom to top. The x-axis represents increasing impact to Ford from left to right. “Current or potential impact on Ford” is defined as the potential an issue has to impact Ford’s financial position; corporate reputation, including standing in local communities, social license to operate and consumer perceptions of our company and products; employee productivity and retention; and other key impacts. The materiality matrix features all issues mapped based on their prioritization. Issues found closer to the upper right-hand corner of the matrix are of higher importance to Ford and stakeholders in comparison to other material issues plotted lower on either axis.



Explore our interactive materiality matrix.

> [A Closer Look at Our Material Issues](#)

## Validation and Review

The results of the materiality analysis were reviewed internally by Ford’s Sustainability & Vehicle Environmental Matters (S&VEM) group and regional stakeholders. Following internal review, we reviewed the analysis with several external stakeholders representing socially responsible investors and sustainability experts. A Ceres stakeholder committee that included representatives of environmental and other nongovernmental organizations, socially responsible investment organizations and a supplier company also reviewed the analysis.

Following these reviews, revisions were made to ensure that all feedback was appropriately reflected; that our process and list of high-importance issues were complete, well understood and inclusive of the perspectives sought from stakeholders; and that the analysis reflected the context of sustainability issues currently and over the next three to 10 years. We’ve discussed how we responded to the Ceres committee’s recommendations further in [About This Report](#).

## Use of the Analysis

We use this analysis to identify issues to cover in our reporting and as an input to our sustainability strategy development. The analysis, and the methods for conducting materiality analyses generally, are works in progress. Though we undertake an in-depth materiality analysis every two years, we continue to consider material issues and stakeholder inputs informally between formal analyses. We are continually improving our reporting based on these formal and informal assessments of changing issues and stakeholder perspectives.

We work hard to ensure that our materiality analysis and its results are comprehensive and precise, without being so complicated that they are difficult to understand or apply. However, sustainability issues are not discrete. Rather, they overlap and interconnect in a complex system that is difficult to capture in a list of issues. Analyzing issues by stakeholder group adds depth to our understanding of who is concerned about which issues and why, but in the process of placing them on a two-dimensional matrix, some of that nuance is lost. Finally, an element of subjectivity is inevitable.

We have participated with other companies and organizations in documenting and benchmarking current methods for materiality analysis, with the expectation that this will help advance the practice.

### READ MORE:

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- > [Global Megatrends](#)
- > [Stakeholder Engagement](#)
- > [Our Value Chain and Its Impacts](#)

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# Results of the Materiality Analysis

The materiality analysis conducted in 2014 and early 2015 indicated that several issues remain highly important to both Ford and our stakeholders, compared to the 2013 analysis.

These included:

- Product carbon footprint and fuel economy
- Environmental management/process innovation
- Supply chain management, assessment, capacity building
- Community impacts of operations
- Ethical business practices
- Fuel economy and greenhouse gas (GHG) regulation
- Public policy (non-fuel economy or GHG regulation related)

In addition, some new issues emerged, some dropped out and others were recast or reorganized. Significant changes from previous analyses included the following:

- **Product innovation and mobility innovation** emerged as highly important, “top-right,” issues for stakeholders and Ford. Although elements of these issues were incorporated into former top-right issues (e.g., low-carbon strategy, electrification and vehicle GHG emissions), Ford’s emphasis on and stakeholder demand for greater innovation in Ford products, business models and new mobility systems moved these issues to a position of greater prominence.
- **Human capital management**, an issue incorporating a range of employee management, engagement, and human rights topics, increased in importance from last year’s analysis, becoming a highest importance, top-right issue. Changes in the global workforce, new approaches to human capital management, greater transparency and reporting around human capital practices and a heightened appreciation of the importance of engaged employees in meeting the company’s sustainability commitments drove this issue to gain greater importance.
- **Product quality** increased in importance compared to the previous analysis, becoming a highest importance, top-right issue. External and internal stakeholders are concerned with product quality to ensure safety and also satisfy changing consumer demands. Media attention to recalls further raised the importance of the issue.
- **Big data**, including global data analytics to better understand customers and improve product performance, emerged as a new issue at the highest level of importance. Automobiles and transportation infrastructure are incorporating more technology to support greater mobility convenience, connectivity, efficiency and effectiveness. A greater emphasis is being placed internally and externally on data management, including security and privacy, to gain insights into driver behavior and continuously evolve products.

- **Water issues, including operational water use and local community impacts of water** dropped in importance from the previous analysis, likely reflecting Ford's progress in managing these issues and Ford's relatively small impacts on water resources compared with companies in other industries.

**READ MORE:**



Take a closer look at our material issues

> [A Closer Look at Our Material Issues](#)

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# A Closer Look at Our Material Issues

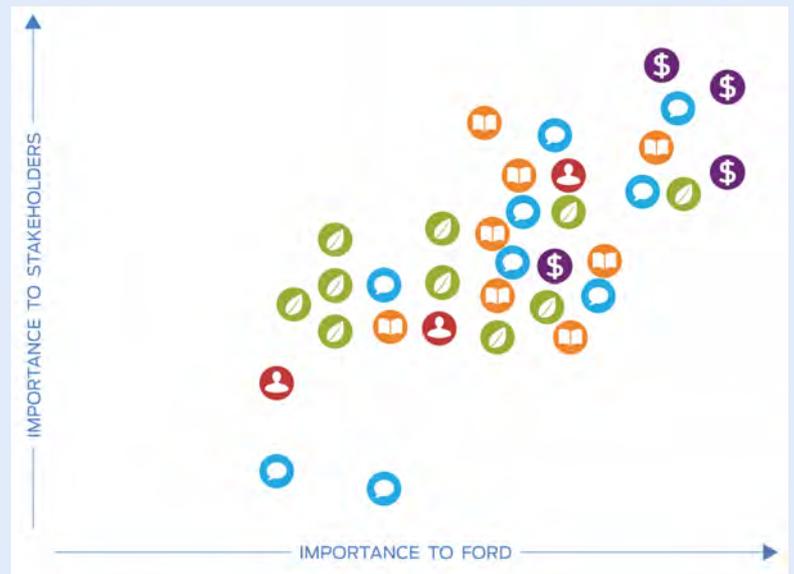
Below is an interactive diagram of the material issues that are of concern to stakeholders and Ford Motor Company.

Explore a particular issue category or issue to learn more, including insight into current or potential impact on the company, the boundaries of the issue across our [value chain](#), related Global Reporting Initiative (GRI) aspects and the sustainability megatrends affecting these issues into the future.

Choose a category/issue:

- Full matrix
- Financial**
  - Financial Health
  - Product Innovation
  - Mobility Innovation
  - Brand Perception
- Environmental**
  - Operations and Logistics Energy Use and GHG Emissions
  - Product Carbon Footprint/Fuel Economy
  - Climate Change Resilience Strategy
  - Customer Demand for Fuel Efficiency
  - Operations Water Use
  - Community Impacts of Water Use
  - Biodiversity and Land Use
  - Materials and Waste Management
  - Environmental Management and Process Innovation
  - Air Quality
- Human**
  - Human Capital Management

## Materiality Matrix



Download the full matrix (pdf, 1.6Mb)

## Financial

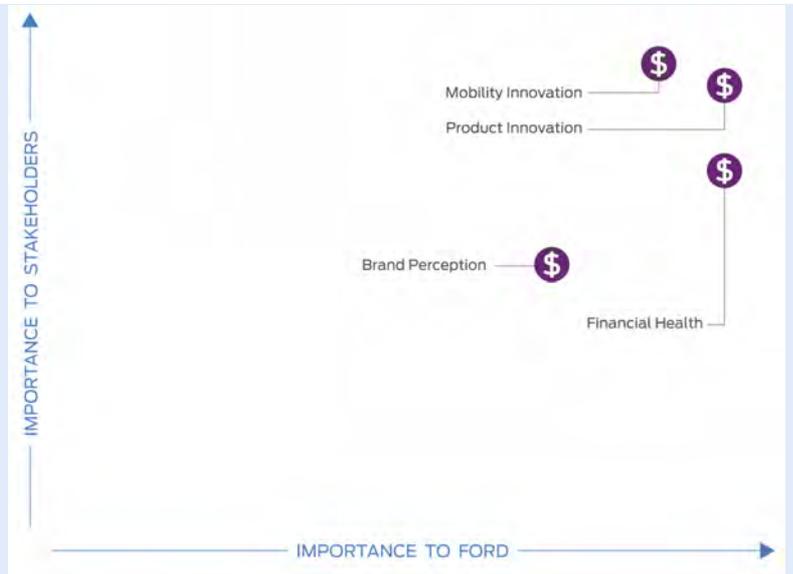
Diversity and Inclusion  
Employee Wellness, Health and Safety

**Social**

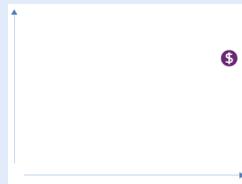
Supply Chain Management, Assessment, Capacity Building and Performance  
Vehicle and Traffic Safety  
Product Quality  
Community Impacts of Operations  
Community Engagement  
Customer Satisfaction  
Customer Privacy and Data Protection  
Dealer Relationships  
Big Data

**Governance**

Ethical Business Practices  
Disclosure and Transparency  
Sustainability Strategy and Vision  
Stakeholder Engagement  
Regulatory Compliance  
Voluntary Standards and Certifications  
Fuel Economy and GHG Regulations  
Other Regulations/Policy



**Financial Health**



- Wide-ranging issue covering all elements of profitable operations, including:
  - Building products customers want/product competitiveness
  - Cost and risk management
  - Financing
  - New product launch costs, timing, production capacity

**Issue Boundaries**

- Inside the organization this issue is material for all of Ford's operating regions and business units and its employees and dealers
- Outside the organization this issue is most material for:
  - **Stakeholders:** Suppliers, communities and investors
  - **Value Chain Stage:** Supplier parts manufacturing, sales

**Related GRI Aspects**

- Economic performance
- Direct economic value generated and distributed

**Related Megatrends**

- Growing Population
- Emerging vs. Shrinking Middle Class
- Local vs. Global
- Urbanization
- Resource and Carbon Constraints
- Disruptive Innovation and Big Data

**Product Innovation**



- Innovations in customer interface technologies, e.g., SYNC® and MyFord Touch®
- Innovations in fuel economy and alternative fuels and powertrains, e.g. EcoBoost®,

electrification and biofuels

- Incorporates both developing new products that meet customer demands and meeting regulatory requirements
- Differs from business model innovation due to focus on innovations in traditional passenger vehicles rather than new models of mobility

#### Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units and its employees and dealers
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Customers, investors, suppliers
  - [Value Chain Stage](#): Supplier parts manufacturing, sales, use

#### Related GRI Aspects

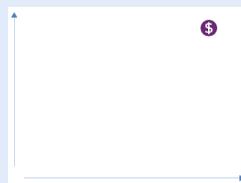
- None

#### Related Megatrends

- Growing Population
- Young vs. Old
- Emerging vs. Shrinking Middle Class
- Urbanization
- Resource and Carbon Constraints
- Disruptive Innovation and Big Data

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### 💰 Mobility Innovation



- Focuses on new models for sustainable mobility, including:
  - Vehicle-to-infrastructure communications
  - Non-vehicle or multi-modal mobility systems
  - New ownership models

#### Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Customers, investors, suppliers
  - [Value chain stage](#): Sales, use

#### Related GRI Aspects

- None

#### Related Megatrends

- Growing Population
  - Young vs. Old
  - Emerging vs. Shrinking Middle Class
  - Urbanization
  - Resource and Carbon Constraints
  - Disruptive Innovation and Big Data
-

## Brand Perception



- Customer, NGO, investor and other stakeholder perceptions of brand
- Perceptions about products, including quality and performance, innovation and technologies, and sustainability
- Perceptions of Ford as a company, including sustainability vision and performance

### Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Customer, investors
  - [Value chain stage](#): Sales, service, use

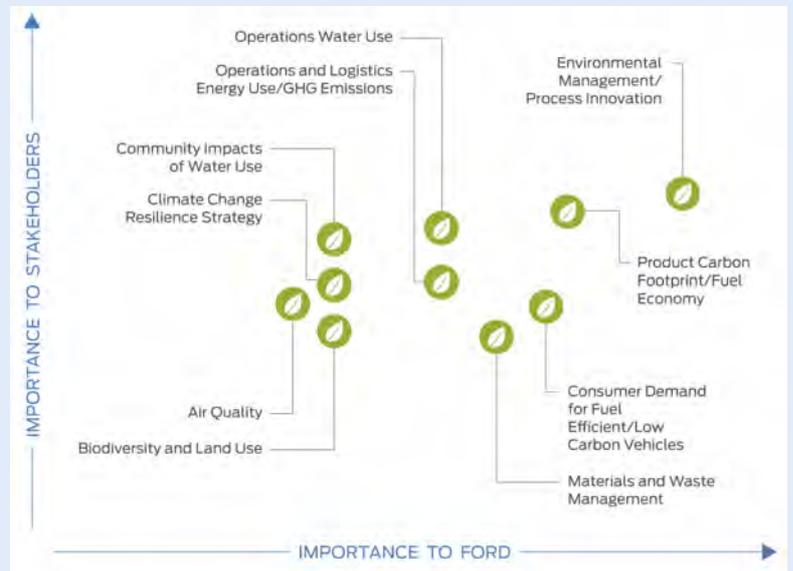
### Related GRI Aspects

- Economic performance

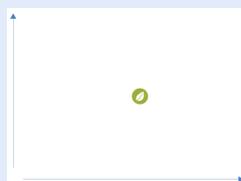
### Related Megatrends

- Young vs. Old
- Resource and Carbon Constraints
- Disruptive Innovation and Big Data

## Environmental



## Operations and Logistics Energy Use and GHG Emissions



- Energy used and greenhouse gas (GHG) emissions generated by Ford's own operations including Scope 1 (direct) and Scope 2 (indirect) GHG emissions
- Energy used and GHG emissions from transporting materials and components from suppliers to Ford and finished vehicles from Ford to dealerships

## Issue Boundaries

- Employee travel and commuting
- Incorporates some key elements of Scope 3 emissions, but does not include supplier operational emissions or vehicle use phase emissions
- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Investors and suppliers
  - [Value chain stage](#): Raw material extraction, logistics and transportation

## Related GRI Aspects

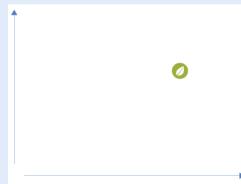
- Energy
- Emissions
- Products and services
- Transport

## Related Megatrends

- Emerging vs. Shrinking Middle Class
- Resource and Carbon Constraints

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## Product Carbon Footprint/Fuel Economy



- Fuel use and greenhouse gas (GHG) emissions from Ford vehicles during use by customers
- Linked with product innovation and implementation of fuel-efficient and alternative powertrain and fuels technologies

## Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Suppliers, customers, dealers, investors
  - [Value chain stage](#): Sales, service, use

## Related GRI Aspects

- Economic performance
- Products and services
- Emissions

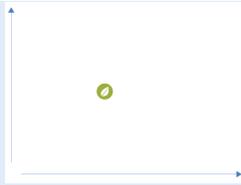
## Related Megatrends

- Growing Population
- Emerging vs. Shrinking Middle Class
- Urbanization
- Resource and Carbon Constraints

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## Climate Change Resilience Strategy

- Assessing climate-change-related risks to product strategy, facilities and physical infrastructure, supply chain, regulatory



environment, consumer demand, etc.

- Developing plans to avoid and/or respond to these risks

Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Investors, suppliers, communities
  - [Value Chain Stage](#): Raw material extraction, logistics/transportation and supplier parts manufacturing

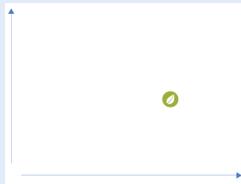
Related GRI Aspects

- Economic performance

Related Megatrends

- Growing Population
- Emerging vs. Shrinking Middle Class
- Urbanization
- Resource and Carbon Constraints

 Customer Demand for Fuel Efficiency



- Customer demand for fuel-efficient and low-carbon products
- Possible mismatch between customer demand for these products and regulatory requirements to produce them
- Volatility in customer demand for fuel efficiency resulting from volatility in gas prices

Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Customers, investors
  - [Value Chain Stage](#): Supplier parts manufacturing, sales, use

Related GRI Aspects

- Economic performance

Related Megatrends

- Growing Population
- Young vs. Old
- Urbanization
- Resource and Carbon Constraints



- Water use by Ford's operations; especially operations in water-stressed regions
- Water management, water treatment and discharge
- Cost of water
- Need to assess water use and risks by region based on levels of water stress, water availability and quality
- Links between climate change and changes in water availability and water stress

#### Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers; especially material for operations in water-stressed regions, including Mexico, South Africa and India
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Investors, suppliers, communities
  - [Value Chain Stage](#): N/A

#### Related GRI Aspects

- Water
- Effluents and waste
- Products and services

#### Related Megatrends

- Resource and Carbon Constraints
- Disruptive Innovation and Big Data

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### Community Impacts of Water Use



- Impacts of Ford and Ford suppliers' water use on local communities
- Need for community-based assessments of water impacts
- Links between climate change and changes in water and food availability and water stress

#### Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers; especially material for operations in water-stressed regions, including Mexico, South Africa and India
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Communities, investors
  - [Value Chain Stage](#): Raw material extraction, supplier parts manufacturing

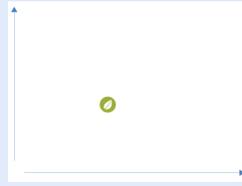
#### Related GRI Aspects

- Water
- Effluents and waste
- Products and services

#### Related Megatrends

- Growing Population
- Resource and Carbon Constraints

## Biodiversity and Land Use



- Ford's most significant impacts on land use and biodiversity are indirect and related to the effects of auto travel generally, including road building, urban/suburban sprawl and associated changes to habitats and ecosystems
- Raw material suppliers to Ford may also have significant impacts on land use and biodiversity
- Currently considered less material are the direct impacts of Ford's operations on nature and biodiversity including:
  - impacts of building new facilities
  - rehabilitation and reclamation of former production sites when closed or sold

### Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Communities
  - [Value Chain Stage](#): Raw material extraction, use

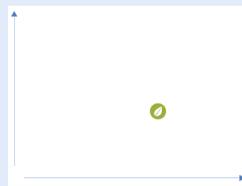
### Related GRI Aspects

- Biodiversity

### Related Megatrends

- Growing Population
- Emerging vs. Shrinking Middle Class
- Local vs. Global
- Resource and Carbon Constraints

## Materials and Waste Management



- Includes use of sustainable materials in vehicles, including recycled, renewable and recyclable materials
- Vehicle end-of-life management and recycling
- Operational waste generation and management
- Non-greenhouse gas air emissions, toxic waste, other emissions and effluents from operations

### Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers

Outside the organization this issue is most material for:

- [Stakeholders](#): Customers, investors, communities
- [Value Chain Stage](#): Raw material extraction, supplier parts manufacturing, service and end of life

Related GRI Aspects

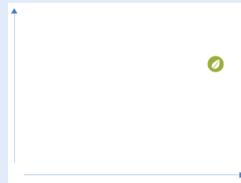
- Materials
- Effluents and waste
- Products and services

Related Megatrends

- Growing Population
- Young vs. Old
- Emerging vs. Shrinking Middle Class
- Urbanization
- Resource and Carbon Constraints

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## Environmental Management and Process Innovation



- Ford's environmental management systems for production and product development
- Life cycle analysis for products
- Opportunities for reducing environmental impacts and costs through process innovations

Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Investors, customers, suppliers and communities
  - [Value Chain Stage](#): Raw material extraction, logistics/transportation, supplier parts manufacturing, service and end of life

Related GRI Aspects

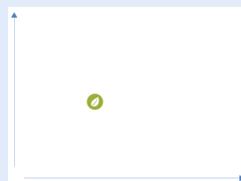
- Disclosures on Management Approach

Related Megatrends

- Emerging vs. Shrinking Middle Class
- Urbanization
- Resource and Carbon Constraints
- Disruptive Innovation and Big Data

---

## Air Quality



- Impacts of Ford's products and operations on local air quality, including smog-forming emissions

Issue Boundaries

- Inside the organization this issue is material for all

of Ford's operating regions and business units and employees and dealers

- Outside the organization this issue is most material for:
  - [Stakeholders](#): Customers and communities
  - [Value Chain Stage](#): Service and use

Related GRI Aspects

- Emissions

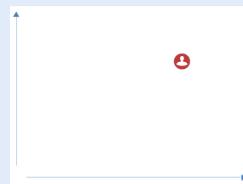
Related Megatrends

- Growing Population
- Emerging vs. Shrinking Middle Class
- Urbanization
- Resource and Carbon Constraints

## Human



## Human Capital Management



- Includes a range of employee and workplace issues:
  - Corporate culture, collaborative environment
  - Employee and leadership development
  - Labor management and collective bargaining
  - Decent work and employee human rights
  - Employee engagement
  - Workforce planning
  - Compensation
  - Talent attraction and retention

Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers
- Outside the organization this issue is most material

for:

- [Stakeholders](#): Communities (whose interests are often tied to those of employees), investors
- [Value Chain Stage](#): N/A

Related GRI Aspects

- Economic performance
- Employment
- Labor and management relations
- Training and education
- Labor practices grievance mechanisms
- Human rights
- Freedom of association and collective bargaining
- Child labor
- Forced or compulsory labor
- Assessment
- Human rights grievance mechanism

Related Megatrends

- Growing Population
- Young vs. Old
- Emerging vs. Shrinking Middle Class
- Local vs. Global
- Urbanization

---

## Diversity and Inclusion



- Diversity of Ford's Board of Directors, management and employees
- Anti-harassment programs and monitoring
- Other efforts to foster a diverse and inclusive workplace
- Supplier diversity programs

Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Customers and suppliers
  - [Value Chain Stage](#): Supplier parts manufacturing, sales

Related GRI Aspects

- Training and education
- Diversity and equal opportunity
- Equal remuneration for men and women
- Non-discrimination

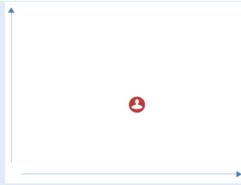
Related Megatrends

- Growing Population
- Young vs. Old
- Emerging vs. Shrinking Middle Class

---

## Employee Wellness, Health and Safety

- Includes employee health and wellness enhancement programs, healthcare and



insurance programs, work/life balance programs

- Also includes employee safety programs and management and efforts to create a culture of safety

Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Investors
  - [Value Chain Stage](#): N/A

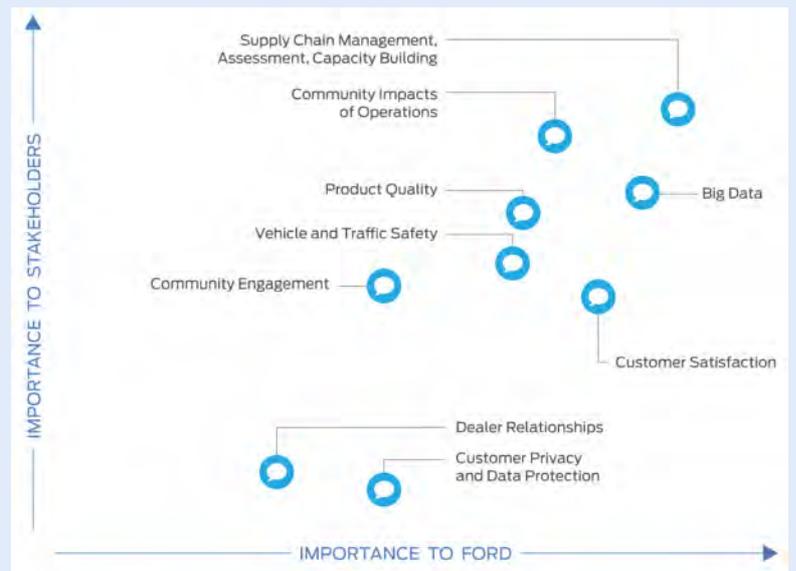
Related GRI Aspects

- Occupational health and safety
- Training and education

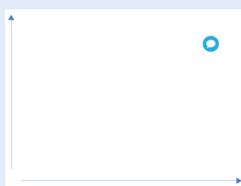
Related Megatrends

- Young vs. Old
- Emerging vs. Shrinking Middle Class

 Social



 Supply Chain Management, Assessment, Capacity Building and Performance



- Ford's programs to engage with suppliers on environmental, social and human rights issues
- Programs to assess and build supplier capacity to manage environment, social and human rights issues, as well as suppliers' actual performance on these issues
- Critical materials input sourcing, including the impacts of raw material extraction and conflict minerals

## Issue Boundaries

- Supplier relationships
- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Suppliers and investors
  - [Value Chain Stage](#): Raw material extraction, logistics/transportation and supplier parts manufacturing

## Related GRI Aspects

- Supplier assessment for labor practices
- Human rights
- Child labor
- Forced or compulsory labor
- Supplier human rights assessment
- Energy
- Emissions
- Supplier environmental assessment

## Related Megatrends

- Emerging vs. Shrinking Middle Class
- Local vs. Global
- Urbanization
- Resource and Carbon Constraints

---

## 🔍 Vehicle and Traffic Safety



- The safety performance of Ford's products, including:
  - Occupant protection technologies
  - Accident avoidance and driver assist technologies
  - Post-crash response technologies
  - Recalls
  - Third-party ratings
  - Compliance with non-harmonized government regulations
- Traffic and pedestrian safety

## Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Customers, suppliers, investors
  - [Value Chain Stage](#): Supplier parts manufacturing, sales, service, use

## Related GRI Aspects

- Customer health and safety

## Related Megatrends

- Growing Population
- Young vs. Old
- Urbanization
- Disruptive Innovation and Big Data

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## Product Quality



- The quality of Ford's products, including:
  - Performance issues
  - Customer satisfaction
  - Recalls
  - Third-party ratings

### Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Customers, suppliers, investors
  - [Value Chain Stage](#): Supplier parts manufacturing, sales, service, use

### Related GRI Aspects

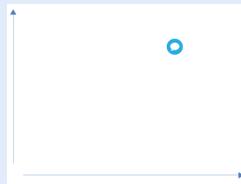
- Product service and labeling

### Related Megatrends

- Growing Population
- Local vs. Global
- Urbanization
- Disruptive Innovation and Big Data

---

## Community Impacts of Operations



- Job creation
- Environmental impacts
- Human rights of local community members and other social impacts
- Community investment and philanthropy
- Community health and wellness

### Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Local communities
  - [Value Chain Stage](#): Raw material extraction and supplier parts manufacturing

### Related GRI Aspects

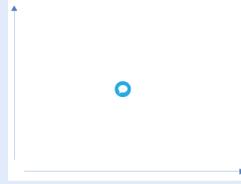
- Economic performance
- Indirect economic impacts
- Effluents and waste
- Products and services
- Supplier environmental assessment
- Local communities
- Grievance mechanisms for impacts on society

### Related Megatrends

- Growing Population
- Young vs. Old
- Emerging vs. Shrinking Middle Class

- Local vs. Global
- Urbanization
- Resource and Carbon Constraints

## Community Engagement



- Ford's efforts to engage constructively with local communities
- License to operate
- NGO relationships
- Specific community concerns such as compliance

### Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Communities
  - [Value Chain Stage](#): N/A

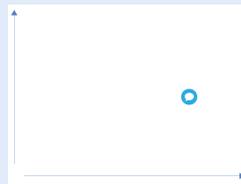
### Related GRI Aspects

- Local communities

### Related Megatrends

- Growing Population
- Emerging vs. Shrinking Middle Class
- Local vs. Global
- Urbanization

## Customer Satisfaction



- Includes vehicle quality and safety
- Customer responses to and satisfaction with Ford's vehicles, including driver interface technologies, fuel-efficiency technologies, and alternative powertrains and fuels
- Third-party safety and quality ratings

### Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Customers, suppliers
  - [Value Chain Stage](#): Supplier parts manufacturing, sales, use, service

### Related GRI Aspects

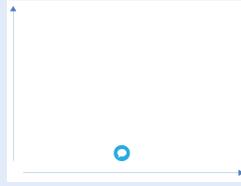
- Product and service and labeling

### Related Megatrends

- Growing Population
- Young vs. Old
- Resource and Carbon Constraints
- Disruptive Innovation and Big Data

---

## Customer Privacy and Data Protection



Issue Boundaries

- Ford's management of customer data to maintain customer privacy and safety

Related GRI Aspects

- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Customers
  - [Value Chain Stage](#): Sales, service, use

Related Megatrends

- Customer privacy
- Growing Population
- Disruptive Innovation and Big Data

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## Dealer Relationships



Issue Boundaries

- Collaboration with dealers on customer satisfaction, product development and marketing

Related GRI Aspects

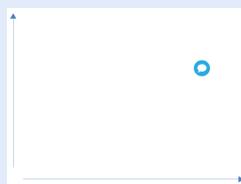
- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Customers
  - [Value Chain Stage](#): Supplier parts manufacturing, sales, use, service

Related Megatrends

- None
- Growing Population
- Emerging vs. Shrinking Middle Class
- Urbanization

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## Big Data



Issue Boundaries

- Ford's use of data science and analytics to better understand consumer behavior and help speed development of mobility, connectivity and autonomous driving innovations

- Inside the organization this issue is material for all

of Ford's operating regions and business units and employees and dealers

- Outside the organization this issue is most material for:
  - [Stakeholders](#): Suppliers and customers
  - [Value Chain Stage](#): Supplier parts manufacturing, sales, use, service

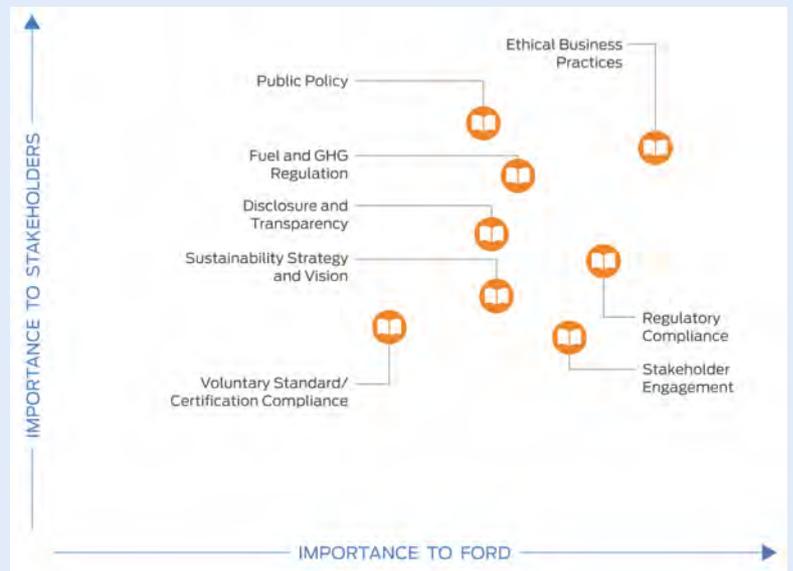
Related GRI Aspects

- Public policy
- Customer privacy

Related Megatrends

- Growing Population
- Young vs. Old
- Local vs. Global
- Urbanization
- Resource and Carbon Constraints
- Disruptive Innovation and Big Data

## Governance



## Ethical Business Practices



- Includes key elements of corporate governance:
  - Code of conduct
  - Anti-corruption/anti-bribery
  - Board and management performance reviews, election, compensation
  - Conflicts of interest

Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Investors, suppliers and customers
  - [Value Chain Stage](#): Supplier parts manufacturing, sales, use, service

Related GRI Aspects

- Anti-corruption
- Anti-competitive behavior

Related Megatrends

- Growing Population
- Young vs. Old
- Emerging vs. Shrinking Middle Class
- Local vs. Global
- Resource and Carbon Constraints
- Disruptive Innovation and Big Data

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## Disclosure and Transparency



- Ford's efforts to disclose relevant information to stakeholders and be transparent on performance, goals and challenges
- Voluntary and required reporting on sustainability, financial and other topics

Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Investors and suppliers
  - [Value Chain Stage](#): Raw material extraction, supplier parts manufacturing, sales, use, service, end of life

Related GRI Aspects

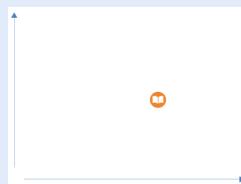
- Public policy
- Product and service labeling

Related Megatrends

- Resource and Carbon Constraints
- Disruptive Innovation and Big Data

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## Sustainability Strategy and Vision



- Includes Ford's overall vision for and commitment to sustainability as well as specific plans for more sustainable products, processes and business models
- Sustainability goals and targets
- Linking of sustainability to overall business strategy
- Meeting stakeholder expectations related to sustainability

Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Investors, communities, customers, suppliers
  - [Value Chain Stage](#): Raw material extraction,

supplier parts manufacturing, sales, use, service, end of life

Related GRI Aspects

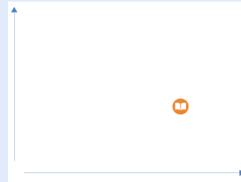
- None

Related Megatrends

- Growing Population
- Young vs. Old
- Urbanization
- Resource and Carbon Constraints

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## Stakeholder Engagement



- Ford's efforts to engage with all stakeholders proactively on sustainability issues and respond to concerns raised
- Includes reporting and other Ford-led communications

Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Investors, customers, communities, suppliers
  - [Value Chain Stage](#): Raw material extraction, supplier parts manufacturing, sales, use, service, end of life

Related GRI Aspects

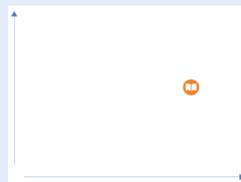
- Local communities

Related Megatrends

- Growing Population
- Young vs. Old
- Emerging vs. Shrinking Middle Class
- Resource and Carbon Constraints
- Disruptive Innovation and Big Data

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## Regulatory Compliance



- Processes for ensuring regulatory compliance
- Compliance performance

Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Suppliers, investors, communities, customers
  - [Value Chain Stage](#): Raw material extraction, supplier parts manufacturing, sales, use, end of life

Related GRI  
Aspects

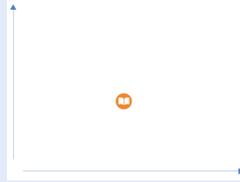
- Compliance (Environment category)
- Compliance (Product Responsibility category)

Related  
Megatrends

- Resource and Carbon Constraints
- Disruptive Innovation and Big Data

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## Voluntary Standards and Certifications



- Performance improvements, tracking programs and efforts to obtain third-party certifications and/or ratings

Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Suppliers, customers, investors
  - [Value Chain Stage](#): Raw material extraction, supplier parts manufacturing, end of life

Related GRI  
Aspects

- None

Related  
Megatrends

- Young vs. Old
- Resource and Carbon Constraints

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## Fuel Economy and GHG Regulations



- Ford's engagement in public policy dialogue about regulations related to fuel economy and greenhouse gas (GHG) emissions
- Risks and opportunities associated with increasing regulation of these issues
- Management and disclosure of public policy positions and related engagement

Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Suppliers, customers
  - [Value Chain Stage](#): Supplier parts manufacturing, sales, use

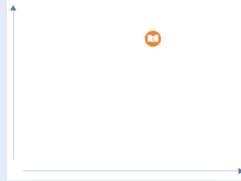
Related GRI  
Aspects

- Public policy

Related  
Megatrends

- Growing Population
  - Urbanization
  - Resource and Carbon Constraints
-

## Other Regulations/Policy



- Ford's efforts to engage in public policy dialogue and shape issues other than fuel economy and greenhouse gas regulations, including non-CO<sub>2</sub> tailpipe emissions and materials and chemicals regulations
- Risks and opportunities associated with regulations on those issues
- Management and disclosure of public policy positions and related engagement on those issues

### Issue Boundaries

- Inside the organization this issue is material for all of Ford's operating regions and business units and employees and dealers
- Outside the organization this issue is most material for:
  - [Stakeholders](#): Suppliers, customers, communities, investors
  - [Value Chain Stage](#): Raw material extraction, supplier parts manufacturing, service, end of life

### Related GRI Aspects

- Public policy

### Related Megatrends

- Growing Population
- Local vs. Global
- Urbanization
- Resource and Carbon Constraints
- Disruptive Innovation and Big Data

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Home	Year in Review	<b>Strategy and Governance</b>	MOBILITY	PRODUCT QUALITY AND SAFETY	CLIMATE CHANGE AND ENVIRONMENT	OUR PEOPLE	SUPPLY CHAIN	COMMUNITIES
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Strategy and Governance

- Business Strategy
- Sustainability Strategy
- ∨ Financial Health
- ∨ Materiality Analysis
- > **Our Value Chain and Its Impacts**
- Global Megatrends
- ∨ Sustainability Governance
- ∨ Public Policy
- ∨ Stakeholder Engagement

# Our Value Chain and Its Impacts

As a major multinational enterprise, our activities have far-reaching environmental, social and economic impacts.

The graphic below illustrates the major stages of our value chain and identifies key impacts, stakeholders, and examples of value we create at each stage.

We recognize that the issues and impacts are interconnected and that positive and negative effects in one part of the chain can reverberate in the other parts. The value chain assessment was revised and updated for this report as part of our [materiality analysis](#), which prioritizes the most significant issues in our value chain.

## Product Planning and Design



This stage has far-reaching impacts throughout our value chain, as it includes all major decisions about which products we will make, what technologies we will develop and implement, and how and where our products will be made.

Innovation and R&D play a key role in our ability to enhance positive impacts and reduce negative impacts of our products and operations. We also add indirect value and have indirect impacts at this stage based on the decisions we make about products, manufacturing processes, manufacturing volumes, suppliers, etc.

### Highlights

In 2014 we spent  
**\$6.9 billion**  
 on engineering, research and development.

**817**  
 U.S. utility patents were issued to Ford and subsidiaries for new technologies and processes we developed in 2014.

### Key Stakeholders

- Ford
- Employees
- Suppliers
- Communities

### Key Issues / Impacts

- Financial Health
- Product Innovation
- Mobility Innovation
- Brand Perception
- Operations and Logistics Energy Use and GHG Emissions
- Product Carbon Footprint / Fuel Economy
- Customer Demand for Fuel Efficiency
- Materials and Waste Management
- Environmental Management and Process Innovation
- Human Capital Management
- Diversity and Inclusion
- Employee Wellness, Health and Safety
- Supply Chain Management, Assessment, Capacity Building, and Performance
- Vehicle and Traffic Safety
- Product Quality
- Customer Satisfaction

In 2014 we launched

# 24

new or significantly refreshed vehicles to customers around the world – the most in a single year in more than a century.

- Ethical Business Practices
- Sustainability Strategy and Vision
- Regulatory Compliance
- Voluntary Standards and Certifications
- Fuel Economy and GHG regulations
- Other Policy / Regulations
- Big Data

## Raw Material Extraction



This stage can have significant impacts on the communities where extraction occurs. Extraction creates value for raw material suppliers and local communities through employment and other benefits.

However, it also has significant environmental and social impacts on local communities. We are working to reduce negative impacts from extraction, including addressing issues relating to Conflict Minerals, human trafficking and rare earth elements.

### Highlights

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Since 2011, we have been asking our global production supply base to report their use of Conflict Minerals by material weight.

---

We submitted our first Securities and Exchange Commission (SEC) report on conflict minerals in 2014.

### Key Stakeholders

- Suppliers
- Communities
- Ford

### Key Issues / Impacts

- Operations and Logistics Energy Use and GHG Emissions
- Climate Change Resilience Strategy
- Community Impacts of Water Use
- Land Use and Biodiversity
- Materials and Waste Management
- Environmental Management and Process Innovation
- Supply Chain Management, Assessment, Capacity Building, and Performance
- Community Impacts of Operations
- Disclosure and Transparency
- Sustainability Strategy and Vision
- Stakeholder Engagement
- Regulatory Compliance
- Fuel Economy and GHG Regulations

## Logistics / Transportation



This stage includes the transport of parts from our suppliers to our manufacturing plants and of finished vehicles from our factories to our dealerships.

We create value at this stage by providing business and jobs in the transportation and packaging industries. We also work to reduce emissions and waste associated with parts transportation and packaging. However,

### Key Stakeholders

- Suppliers
- Ford
- Employees
- Communities

### Key Issues / Impacts

- Operations and Logistics Energy Use and GHG Emissions

transportation causes impacts to local communities and the environment, especially in the areas of emissions, waste, traffic and road safety.

## Highlights

---

Since 2006, we have been tracking and reporting transportation- and logistics-related GHG emissions; we now track this for all our regions and report externally for North America, South Africa, India and Australia.

---

We are reducing our freight emissions by reducing the number of vehicle miles traveled to deliver parts, as well as by improving route efficiencies and switching to lower-emission transport methods.

- Climate Change Resilience Strategy
- Environmental Management and Process Innovation
- Supply Chain Management, Assessment, Capacity Building, and Performance

## Supplier Parts Manufacturing



Supplier parts manufacturing includes our direct suppliers as well as multiple levels of suppliers who provide components to our direct suppliers.

We add value at this stage by providing business to suppliers, which in turn creates jobs, income and investment in communities. We also add value through extensive efforts to improve the sustainability of our suppliers' operations. We also generate indirect impacts at this stage, primarily in the form of environmental impacts of parts manufacturing and social and economic impacts to local communities based on changes in our supplier base and production levels.

## Highlights

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In 2014, we spent over

**\$100 billion**

with more than 12,200 production and non-production supplier companies globally.

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All of our direct suppliers adhere to our requirements on human rights, working conditions and environmental sustainability, as laid out in our Global Terms and Conditions.

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To date, Ford's supplier training programs have

## Key Stakeholders

- Suppliers
- Ford
- Communities
- Employees

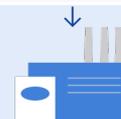
## Key Issues / Impacts

- Financial Health
- Product Innovation
- Climate Change Resilience Strategy
- Customer Demand for Fuel Efficiency
- Community Impacts of Water Use
- Materials and Waste Management
- Environmental Management and Process Innovation
- Diversity and Inclusion
- Supply Chain Management, Assessment, Capacity Building, and Performance
- Vehicle and Traffic Safety
- Product Quality
- Community Impacts of Operations
- Customer Satisfaction
- Dealer Relationships
- Ethical Business Practices
- Disclosure and Transparency
- Sustainability Strategy and Vision
- Stakeholder Engagement

impacted more than 3,300 supplier representatives, who in turn have cascaded the training information to nearly 25,000 supplier managers and more than 559,000 individual workers as well as over 115,000 sub-tier supplier companies.

- Regulatory Compliance
- Voluntary Standards and Certifications
- Fuel Economy and GHG Regulations
- Other Policy

## Ford Manufacturing



Manufacturing at our own facilities is the heart of our business and is, of course, the value chain stage where we create the most direct value and impacts.

We create value at this stage through employment and investment in the communities where we operate, and through continual efforts to improve the environmental performance of our operations and to ensure human rights and excellent working conditions for our own employees. Our impacts at this stage include the environmental impacts of our manufacturing facilities, as well as the social and economic impacts of our plant operations.

### Highlights

In 2014, we employed

# 187,000

people globally – 6,000 more than at the end of 2013.

In 2014, we paid

# \$467 million

in worldwide income taxes.

Reduced CO<sub>2</sub> emissions from our global operations in 2014 by

# 2.4 percent

per vehicle produced, compared to 2013.

Also in 2014, we invested

# \$45.6 million

to community activities (over \$8 million more than in 2013).

### Key Stakeholders

- Ford
- Employees
- Communities

### Key Issues / Impacts

- Financial Health
- Product Innovation
- Mobility Innovation
- Brand Perception
- Operations and Logistics Energy Use and GHG Emissions
- Climate Change Resilience Strategy
- Customer Demand for Fuel Efficiency
- Operations Water Use
- Community Impacts of Water Use
- Land Use and Biodiversity
- Materials and Waste Management
- Environmental Management and Process Innovation
- Air Quality
- Human Capital Management
- Diversity and Inclusion
- Employee Wellness, Health and Safety
- Vehicle and Traffic Safety
- Product Quality
- Community Impacts of Operations
- Community Engagement
- Customer Satisfaction
- Dealer Relationships
- Ethical Business Practice
- Disclosure and Transparency
- Sustainability Strategy and Vision
- Stakeholder Engagement
- Regulatory Compliance
- Voluntary Standards and Certifications
- Other Policy / Regulations

## Sales



The sales stage includes our communications with customers about our products and the work of our global dealer network.

We add value at this stage by providing customers with products that meet their needs and exceed their expectations, and through the employment and investment generated by our dealerships.

### Highlights

In 2014, we sold approximately

# 6.32 million

vehicles globally.

Worldwide, we had

# 11,980

Ford and Lincoln dealerships as of year-end 2014.

### Key Stakeholders

- Dealers
- Ford
- Customers
- Investors

### Key Issues / Impacts

- Product Innovation
- Mobility Innovation
- Brand Perception
- Product Carbon Footprint / Fuel Economy
- Customer Demand for Fuel Efficiency
- Diversity and Inclusion
- Vehicle and Traffic Safety
- Product Quality
- Customer Satisfaction
- Customer Privacy and Data Protection
- Dealer Relationships
- Ethical Business Practices
- Disclosure and Transparency
- Sustainability Strategy and Vision
- Stakeholder Engagement
- Voluntary Standards and Certifications
- Other Policy

## Use



Most of the direct value and impacts of our products occur during the use stage, when they are being driven by our customers.

We add value at this stage by delivering high-quality, fuel-efficient products that make our customers' lives better. We generate indirect value by supporting the vast network of businesses that benefit from vehicle use – from fuel providers and road builders to less-obvious beneficiaries such as the travel and tourism industry. We generate impacts through the environmental and social impacts of our vehicles, including tailpipe emissions and vehicle and road safety.

### Highlights

### Key Stakeholders

- Customers
- Ford
- Communities

### Key Issues / Impacts

- Product Innovation
- Mobility Innovation
- Brand Perception
- Product Carbon Footprint / Fuel Economy
- Customer Demand for Fuel Efficiency
- Air Quality
- Vehicle and Traffic Safety
- Product Quality
- Customer Satisfaction

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Our combined corporate average fuel economy improved by about 2 percent due to increased customer demand for cars versus trucks. Our combined fleet CO<sub>2</sub> emissions improved by 9 percent compared to 2009. We reduced the average CO<sub>2</sub> emissions of our European car fleet by approximately 18 percent between the 2006 and 2014 calendar years.

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For the 2015 model year, 15 Ford Motor Company vehicles earned the highest possible Overall Vehicle Score of five stars in the New Car Assessment Program (NCAP) of the U.S. National Highway Traffic Safety Administration (NHTSA). These five-star vehicles include the Ford Edge, Explorer, F-150, Taurus, Fusion, Fusion Energi, Mustang Coupe, Expedition, Navigator and Transit Connect and the Lincoln MKS and MKZ.

- Customer Privacy and Data Protection
- Dealer Relationships
- Ethical Business Practices
- Disclosure and Transparency
- Sustainability Strategy and Vision
- Stakeholder Engagement
- Voluntary Standards and Certifications
- Other Policy

## Service



Our dealer network creates value and impacts through their network of vehicle service centers.

We generate direct value at this stage through the employment and investment of dealership service centers, and by working to reduce the environmental impacts of our service processes, such as recycling used parts. We add indirect value by generating demand for replacement parts and other support services, which in turn provide employment and economic benefits.

### Highlights

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As of the end of 2014, nearly half of our 3,263 U.S. dealers had enrolled in the Go Green program. In the U.S., we continue our Core Recovery Program, through which we have been reusing and recycling parts removed at dealership service centers for use in the production of new Ford vehicles. During the last 10 years, the program has saved approximately 120 million pounds of vehicle waste from being buried in landfills or sent to junkyards, while also reducing costs.

### Key Stakeholders

- Dealers
- Ford
- Customers

### Key Issues / Impacts

- Brand Perception
- Product Carbon Footprint / Fuel Economy
- Materials and Waste Management
- Environmental Management and Process Innovation
- Air Quality
- Vehicle and Traffic Safety
- Product Quality
- Customer Satisfaction
- Customer Privacy and Data Protection
- Dealer Relationships
- Ethical Business Practices
- Disclosure and Transparency
- Sustainability Strategy and Vision
- Voluntary Standards and Certifications
- Fuel Economy and GHG Regulations





Our vehicles have impacts and value even after they are done with their useful driving life.

We generate indirect value at this stage by supporting the vehicle dismantling, recycling and disposal industries. (Ninety-five percent of the materials in our vehicles can be recycled or reused.) Our vehicles also have impacts at end of life primarily in the form of waste production.

### Highlights

In North America, about 95 percent of vehicles that go out of registration are processed by a dismantler or scrap metal recycling facility, with approximately 86 percent of the vehicle by weight recovered for reuse, remanufacturing or recycling. In Europe, Ford has take-back and recycling networks for Ford brand vehicles in 19 EU markets and participates in collective recycling systems in another 10. All Ford vehicles marketed in Europe are now certified as reaching recyclability of 85 percent and recoverability of 95 percent.

### Key Stakeholders

- Recyclers
- Ford
- Communities

### Key Issues / Impacts

- Materials and Waste Management
- Environmental Management and Process Innovation
- Disclosure and Transparency
- Sustainability Strategy and Vision
- Stakeholder Engagement
- Regulatory Compliance
- Fuel Economy and GHG Regulations

#### READ MORE:

*Read more about the materiality analysis process, for which this value chain assessment was a key input*

- > [Overview of the Analysis Process](#)

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# Global Megatrends

The world is changing in significant and surprising ways. Anticipating such changes in the marketplace has never been more critical or more difficult.

Ford has long used “megatrend analysis” as a tool to identify and assess such changes. We focus on global trends – the implications of which vary across the world, impacting our people, our operations and the communities in which we work.

## Megatrends Affecting Our Sustainability Work

Every global megatrend has far-reaching social, technological, economic, environmental and political implications. For the purposes of this sustainability report, we focus on the implications for our sustainability efforts. This section offers a glimpse of some of the trends tracked by the company. Below we call attention to those trends that have played a prominent role in shaping our sustainability reporting and strategy development, including our 2014 [materiality analysis](#)<sup>1</sup>.

It’s important to note, too, that megatrends are not mutually exclusive to any one area of our business. As such, these sustainability megatrends have some overlap with the mobility megatrends identified in the [Mobility](#) section of the report, which focus on drivers of mobility challenges.

**Megatrends** are great forces in societal development that interact and affect each other and will also affect governments, markets and civil society for many years to come.

### Growing population

The global population is growing. To what degree remains up for debate. Some claim we will grow to 9 billion people by 2050, while others claim it will be 11 billion.

What is clear is that much of the growth will take place in areas that are not well equipped to handle it, such as in developing nations, resource-constrained, climate-vulnerable locations, and urban settings with infrastructure constraints. At the same time, we are seeing stagnant or declining fertility rates in developed locations. Overall, these kinds of population changes influence many of the global shifts taking place in the world today (including those described below), and they will shape the social, technological, economic, environmental and political forces of the future.

### The world of opposites

“The future is already here – it’s just not evenly distributed.”

## Young vs. Old

The population in almost every region in the world is aging, which promises to affect society, economies and corporations. In the most advanced economies, people are having fewer children, further compounding the aging of the base population.

This may hinder the ability to manage change, as some members of the older population struggle to adapt to change, or even resist it. On the opposite end of the spectrum, the emerging economies of India, Mexico and Africa have very young populations. The task of bringing these two worlds together may rest with the Millennial generation, which in itself is shaping new approaches to how we work and influencing what products we buy, with particular attention to products that are ethically and sustainably made.

*Examples of Ford's work relating to this trend:*

- > Working at Ford – Employees
- > Autonomous driving research and development
- 📄 Spotlight: Building a Globally Mobile Workforce

## Emerging vs. Shrinking Middle Class

In parts of the world, the middle class is achieving unprecedented growth, while in other parts of the world the middle class is disappearing. Overall the global middle class is predicted to grow 172 percent between 2010 and 2030, resulting in a rise in global wealth, primarily in emerging markets.

This will lead to increased demand for new types of products, services and business structures, but in an environment where resources will be scarcer and more price-volatile. At the same time, some developed nations are tackling a widening gap in income equality, as the middle class begins to shrink and wealth becomes more concentrated among fewer people, creating a whole set of different challenges.

*Examples of Ford's work relating to this trend:*

- > Expanded offerings and sales in emerging markets
- 📄 Bringing medicine to remote communities with SUMURR (Sustainable Urban Mobility with Uncompromised Rural Reach)

## Local vs. Global

Globalization has many benefits but also some disadvantages. As the world tries to grapple with the downsides, the needs of the global community will compete with local priorities.

The potential for collaboration among countries will be influenced by factors such as uneven global distribution of material resources, from oil to land to fresh water, and a desire for home-grown prosperity, making planning for the future even more complex, particularly in trying to address global issues such as poverty and climate change.

*Examples of Ford's work relating to this trend:*

- > Ford's work in and with communities across the globe
- > Conserving water in water-stressed regions
- > People mobility at Ford

## Urbanization



At no time in mankind's history have city populations been so dense. This density brings great opportunities to live sustainably, but also puts greater pressure on infrastructure and natural resources.

In megacities and mega regions, "smart" development is expected to be imperative to deal with the resulting opportunities and challenges. Urban areas must make critical decisions regarding whether to continue using the infrastructure they have, or to develop a new framework for managing challenges such as congestion.

**Megacity:** A metropolitan area with a total population in excess of 10 million people.

**Mega Region:** A clustered network of cities, the population of which currently ranges or is projected to range from 7 to 63 million by 2025.

Examples of Ford's work relating to this trend:

- > Mobility innovation at Ford
- 📄 Spotlight: Improving the Odds in the "Golden Hour"
- 🔗 Ford's Smart Mobility plan and 25 global experiments

## Resource and carbon constraints



As both the developed and developing world continue to grow, innovation and ingenuity will be needed to overcome constraints in the availability of energy and raw materials.

Also, emissions of carbon will need to be curbed as the implications of climate change become clearer. In fact, one of the great challenges of the 21st century will be finding and harnessing enough low-carbon energy to power the new and the old industrial economies, allowing both to grow and prosper.

Examples of Ford's work relating to this trend:

- > Ford's efforts around climate change and the environment
- > Sustainable material use at Ford
- > Managing environmental sustainability in the supply chain
- 📄 Spotlight: Ford Driving Skills for Life / Eco-Driving
- 📄 Spotlight: Reinventing the Ford F-150

## Disruptive innovation and big data



We live in an extraordinary era of disruptive innovation. In 2020, computers are anticipated to be about 200 times faster than today and to have memories 1,000 times as large. Cisco forecasts a 10-fold increase in global mobile data traffic between 2014 and 2019 while information and communication technology systems become more and more intelligent.

There are now more active SIM cards than people on Earth; devices and the data they transmit have made the world more connected than any other time in history. As consumers, we take delight in the benefits ushered in by new technologies and the growth in data and information. It will be important, however, for us

Examples of Ford's work relating to this trend:

- > Workforce planning and analytics at Ford
- > Big data in Ford's mobility innovation efforts
- 📄 Spotlight: Getting a Handle on Mobility
- 🔗 Ford wins 2014 Informs Prize for work on big data

to stay ahead of and manage this explosive growth to minimize unintended consequences. For example, customization may require consumers to disclose information previously considered personal or private. This makes it important for data to be managed responsibly and transparently.

## Emerging Trends/Microtrends

Megatrends, in their nature, are slow moving. It takes time for megatrends to impact society and for the results to become known. And emerging trends – or *microtrends* – are those that have the potential to grow into megatrends.

As a complement to our analysis of megatrends, Ford develops an annual summary of emerging consumer microtrends to help evolve our thinking about the world ahead. The 2015 Ford Trend Report reveals data and insights about the global consumer habits and behaviors expected to shape culture in 2015 and beyond. The insights gathered in this report guide Ford designers and engineers in developing future Ford products and help Ford marketers anticipate customer shopping and ownership habits.

Also see:

 [2015 Ford Trend Report](#) (pdf, 8Mb)

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1. A *materiality analysis* is an analysis that scans, identifies and reviews sustainability issues that are of the highest concern to our stakeholders and that could significantly affect our company's ability to execute its business strategy.

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# Sustainability Governance

To Ford, governance includes more than simply fiduciary responsibility to shareholders; the concept also encompasses accountabilities regarding our impact on the world and responsibilities toward a diverse set of stakeholders.

Upholding high standards of corporate governance is key to maintaining the trust of investors and all our stakeholders. Our sound governance and management systems enable us to operate in a transparent and accountable way and to provide effective oversight of all our operations. Our high ethical standards – formalized in company policies and reinforced by our management team – help us translate our aspirations into action. And importantly, our sustainability-related structures, processes and management systems are integrated into our core business processes.

### READ MORE:

*We have a strong governance system for managing sustainability issues across our organization.*

> [Sustainability Governance and Management Structures](#)

*We have a comprehensive program to back up our commitment to ethical business practices.*

> [Ethical Business Practices](#)

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# Awards and Recognitions

In 2014 and early 2015, Ford received a number of awards and recognitions for our corporate responsibility and sustainability efforts and governance practices.

In 2015, for example, Ford was honored by the **Ethisphere Institute** – for the sixth year in a row – as one of the **World’s Most Ethical Companies**. The Ethisphere Institute’s proprietary rating system assesses companies in five core areas: ethics and compliance program; reputation, leadership and innovation; governance; corporate citizenship and responsibility; and culture of ethics.

In 2014, Ford ranked first on **Interbrand’s list of Best Global Green Brands**, up from second in 2013. The rankings are determined via an analysis of 83 submetrics across six pillars: governance, stakeholder engagement, operations, supply chain, transportation and logistics, products and services. Also, each brand was evaluated based on how the public perception of its environmental sustainability initiatives matches up to its actual performance.

Ford was also recently included on several highly regarded **environmental, social and governance stock indices**, including:

- Dow Jones Sustainability Index North America
- EuroNext Vigeo World 120 list
- EuroNext Vigeo U.S. 50 list
- MacLean’s/Sustainalytics 50 Most Socially Responsible Corporations
- FTSE4Good Index Series

In addition, the **Automotive Science Group (ASG)** awarded three 2015 model year Ford vehicles with “best overall performance” for their segment based on their combined social, environmental and economic performance scores. The Ford Focus Electric was named best overall compact vehicle; the Ford C-MAX Energi plug-in hybrid was named best overall wagon; and the Ford F-150 was named best full-size pickup truck. The ASG assessed more than 1,400 U.S. light vehicles for model year 2015 using a proprietary automotive life cycle assessment platform called the Automotive Performance Index. The Index incorporates social, environmental and economic performance analyses.

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# Sustainability Governance and Management Structures

## Board of Directors

### Board Committees

- Audit
- Compensation
- Nominating and Governance
- Finance
- Sustainability and Innovation

At the board level, the Sustainability and Innovation Committee has primary responsibility for reviewing strategic sustainability issues, though some of those issues are also addressed in other committees and by the board as a whole. In 2015, we added “Innovation” to the Sustainability Committee’s name and expanded their overall charter to illustrate the emphasis on innovation as the means for sustaining our business and our efforts to build a better world.

### Board-Related Policy Documents

- [Corporate Governance Principles](#) (pdf, 135kb)
- [Code of Ethics for Board of Directors](#) (pdf, 33.5kb)

Also see:

- [Corporate Governance – Board of Directors](#)

On our corporate website:

- [Corporate Governance](#)

## Functional Areas that Govern Sustainability Issues

### Dedicated Sustainability Function

- **Ford’s Sustainability and Vehicle Environmental Matters organization** coordinates corporate-wide sustainability strategy and activities, including leading the company’s corporate-level sustainability reporting and stakeholder engagement and collaborating with other functional areas to integrate sustainability throughout the company.

### Sustainability in Other Core Functions

All skill teams lead sustainability-related work:

- Product Development
- Manufacturing and Labor Affairs
- Purchasing
- Quality
- Sustainability, Environment and Safety Engineering
- Information Technology
- Finance
- Human Resources
- General Counsel
- Government and Community Relations
- Marketing, Sales and Service
- Communications

## Executive Management

### Dedicated Sustainability Function

- **VP, Sustainability, Environment and Safety Engineering** has primary responsibility for sustainability issues and oversees the Sustainability & Vehicle Environmental Matters group, the Environmental Quality Office, the Vehicle Homologation & Compliance group and the Automotive Safety Office.

### Sustainability in Other Core Functions

Executive leaders in every skill team have responsibility for sustainability related issues:

- Group VP, Product Development
- Executive VP, Manufacturing and Labor Affairs
- Group VP, Purchasing
- Group VP, Quality
- VP, Sustainability, Environment and Safety Engineering
- VP, Information Technology
- Executive VP, Finance
- Group VP, Human Resources
- Group VP, General Counsel
- Group VP, Government and Community Relations
- Executive VP, Marketing, Sales and Service
- Group VP, Communications

### Issue Specific Structures

We have issue specific governance structures to manage issues that cut across functional areas. For example:

- **Sustainable Mobility Governance:** A senior-level team led by the Vice President of Sustainability, Environment and Safety Engineering governs product actions to respond to climate change and deliver our sustainability strategies in the marketplace. The group's strategic direction, vision, policy and business goals are provided by a senior executive forum, including the vice president and executive stakeholders.

### Key Business Processes for Integrating Sustainability

- Creating Value Roadmap
  - Business Plan Review
  - Special Attention Review
- Business Plan Development and Compensation
- Corporate Policy Letters and Directives
- Sustainability Management Systems

Also see:

- > [Key Business Processes for Integrating Sustainability](#)
- > [Policy Letters and Directives](#)
- > [Sustainability Management](#)

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# Key Business Processes for Integrating Sustainability

## Creating Value Roadmap

The Creating Value Roadmap is the process we follow at Ford to improve our performance continually and deliver on our One Ford plan. The Roadmap enables us to continuously monitor the business environment for risks and opportunities – including sustainability-related risks and opportunities – as well as develop and modify our strategies as needed in response. It also helps create accountability for progress toward key metrics. Important elements of the Creating Value Roadmap include the following:

- **Business Plan Review (BPR) Process:** At the highest level within Ford, we hold weekly BPR meetings to review all elements of the business with each member of the senior leadership team – representing all skill teams and business units – hearing and seeing the same information at the same time. Ford’s sustainability scorecard is reviewed alongside other units’ scorecards at the BPR meetings. In 2013, through [Policy Letter 25](#), we institutionalized the Creating Value Roadmap as the model for how we run the company. Toward that end, we extended the BPR process and SAR process (described below) to each of the business units and skill teams throughout the company. The implementation of Policy Letter 25 thus provides an additional way to ensure consistent global implementation of sustainability-related risk assessment, planning, strategy implementation and performance review. We regularly evaluate our management of sustainability issues and other key business issues as part of our BPR/SAR processes. We make adjustments to management approaches as needed based on these evaluations.
- **Special Attention Review (SAR) Process:** The SAR process brings the senior leadership team together to review significant matters in more detail, and to develop action plans and strategies to address risks and opportunities.
- **Additional governance forums:** In addition to the BPR and SAR, we have the following governance forums: the Automotive Strategy Meeting, Product Matters Meeting, Quality and Productivity Meeting, and Executive Personnel Committee. These forums each provide a venue for us to review key elements of our business, make strategic long-term decisions and develop strategic inputs to the Board of Directors.

## Business Plan Development and Compensation

As part of the annual business planning process, Ford’s business units develop scorecards to track their performance. Sustainability targets are integral to companywide achievements and translate primarily into product manufacturing and financial performance metrics. Metrics from these scorecards are part of the performance assessment of managers at various levels of the company and affect their compensation. Executive compensation is affected by the company’s performance in a range of areas, including sustainability.

## Corporate Policy Letters and Directives

Ford maintains a comprehensive set of [Policy Letters, Directives](#) and other corporate standards that govern all company activities, many relating to sustainability.

## Sustainability Management Systems

Ford uses a variety of systems and processes to manage the different aspects of our business, many of which govern or incorporate sustainability issues. The section on [Sustainability Management](#) details how sustainability is integrated into our management systems as well as specific management systems we have developed to advance our sustainability performance.

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# Corporate Governance – Board of Directors

Ford’s Board of Directors is guided by the company’s corporate governance principles, code of ethics and charters for each board committee – all of which are publicly available in the [corporate governance section](#) of the Ford website.

## Board Committees

The board addresses significant business issues as a full group and through five committees: Audit, Compensation, Finance, Nominating and Governance, and Sustainability and Innovation. The [Sustainability and Innovation Committee charter](#) is available online.

During 2014, 10 directors served on the Sustainability Committee, which was chaired by Dr. Homer Neal, an independent director. On December 31, 2014, Dr. Neal left Ford’s Board of Directors, and existing board member William W. Helman IV took over as chair of the Sustainability Committee effective January 1, 2015. In 2014, Ford’s board met nine times, and the Sustainability Committee met four times. In 2015, we added “Innovation” to the Sustainability Committee’s name and expanded their overall charter to illustrate the emphasis on innovation as the means for sustaining our business and our efforts to build a better world.

## Board Qualifications, Independence and Evaluation

The board’s Nominating and Governance Committee considers several qualifications when considering candidates for the board. Among the most important qualities directors should possess are the highest personal and professional ethical standards, integrity and values. They should be committed to representing the long-term interests of all shareholders. Directors must also have practical wisdom and mature judgment and must be objective and inquisitive.

Ford recognizes the value of diversity, and we endeavor to have a diverse board, with experience in business, international operations, finance, manufacturing and product development, marketing and sales, government, education and technology, and in areas that are relevant to the company’s global activities. Our board members bring a wealth of experience and knowledge about economic, environmental and social issues that may impact the company.

Also see:

[Members of the Board](#)

Twelve of the company’s current 15 directors are independent. Two of Ford’s directors are women, and two are members of minority groups.

Each board member participates in an annual assessment of the effectiveness of the board

and the committees on which he or she serves. As relevant, this evaluation includes an assessment of performance on economic, environmental and social topics. Board members also receive regular training and briefings on a range of key issues related to the business, including economic, environmental and social issues as relevant. We have established a procedure for shareholders to submit accounting and other concerns to independent directors and to send other communications to the board.

**READ MORE:**

- > [Sustainability Governance and Management Structures](#)
- > [Ethical Business Practices](#)
- > [Sustainability Management](#)

*External websites:*

- [↗ Corporate Governance website](#)

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# Policy Letters and Directives

At Ford, Policy Letters establish a framework of broad, basic principles within which the company conducts its business globally. Corporate Directives provide more in-depth information on narrower topics than Policy Letters, and therefore may only apply to a particular segment of the business or to specific activities.

In addition to Policy Letters and Directives, numerous descriptions of business practices, handbooks, guidelines and statements of business standards govern the conduct of personnel globally.

The following are Ford standards with particular relevance to sustainability.

## Human Rights

Ford’s commitment to human rights is embodied in Policy Letter 24, our Code of Human Rights, Basic Working Conditions and Corporate Responsibility, which forms the foundation for work within our own operations and our supply chain. This code articulates our commitments on key human and labor rights issues.

Policy Letter 24 is based on fundamental elements of internationally recognized labor standards, including the Universal Declaration of Human Rights; International Labour Organization Covenants; the Organisation for Economic Co-operation and Development’s Guidelines for Multinational Enterprises; the United Nations’ Global Compact Principles; the Global Sullivan Principles; standards of the Fair Labor Association and International Metalworkers’ Federation; and the “protect, respect and remedy” framework designed by John Ruggie, Special Representative to the United Nations Secretary General on business and human rights at the international level.

Policy Letter 24 covers workplace and recruitment issues such as working hours, child labor and forced labor, human trafficking, health and safety, harassment and discrimination, and freedom of association. It also reflects our increasingly integrated approach to managing human rights and community issues by articulating our commitments on several key issues that extend beyond the fence lines of our facilities, including community engagement and indigenous populations, bribery and corruption, and environment and sustainability. In keeping with this commitment to local communities, the performance criteria for assessments of Ford-owned facilities and facilities operated by Ford address several key community issues and evaluate engagement with members of the local community. The key community issues assessed include environmental impact, local environmental concerns, social performance, volunteerism, philanthropy, and commitment to all local citizens, indigenous populations and community groups.

### On this page:

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- ↓ [Environment and Employee Health and Safety](#)
- ↓ [Creating Value Roadmap](#)
- ↓ [Privacy](#)
- ↓ [Social Media Interactions](#)

Finally, Policy Letter 24 – consistent with our Global Terms and Conditions – communicates our encouragement of suppliers to adopt and enforce similar policies for their suppliers and subcontractors. See the [Supply Chain](#) section for more information.

## Diversity

We are committed to equal opportunity in all aspects of our business and to fostering diversity in our workforce. Our Policy Letter and Directives relating to diversity address equal opportunity and require that there be no disparate treatment because of race, religion, color, age, sex, national origin, disability, gender identity, sexual orientation or veteran status, and other factors that may be covered by local law. We recognize that diversity in our workforce is a valuable asset, and we strive to provide an inclusive work environment in which different ideas, perspectives and beliefs are respected.

## Bribery and Corruption

Our Policy Letters and Directives help set ethical standards within Ford. It is our policy to never pay bribes nor to allow others to pay bribes on our behalf, and to comply fully with the laws of each country in which we do business. Our personnel are directed to immediately report any requests or solicitations for an improper payment through our company reporting system, which allows us to reduce the pressure on our workers to pay bribes. We also do not allow our workers to accept bribes, and we have ethical standards to limit the types of entertainment, gifts and favors our workers can accept.

## Political Contributions

Ford's Policy Letter on governmental relationships covers issues relating to public policy and political contributions. These issues are discussed in depth in the [Public Policy](#) section.

## Customer Satisfaction and Safety

Ford has several policy statements aimed at increasing the quality of our products and promoting the safety of our customers. Our Policy Letter on quality sets the foundation for a process that emphasizes the importance of quality in everything we do and notes that the customer defines quality. It establishes a Quality Operating System and the use of metrics and data to make decisions. Our Policy Letter on vehicle safety sets forth Ford's commitment to design and build vehicles that meet or exceed applicable laws and regulations, and to advance the state of the art in safety wherever practicable. We strive for continuous improvement in vehicle safety, which applies to accident avoidance attributes as well as occupant protection systems. This policy requires that we will be demonstrably active and responsible in all areas of automotive safety, including vehicle design and manufacture, operator behavior and the highway environment.

## Environment and Employee Health and Safety

Our policies on worker health and safety and the global environment make it clear that sustainable economic development is important to the future welfare of Ford and society in general. Protecting these things is an important consideration in the business decisions we make and an integral part of our business planning processes. Our products, services, processes and facilities are planned and operated to incorporate relevant objectives and targets that are periodically reviewed to minimize, to the extent practical, the creation of waste, pollution, and any adverse impact on worker health, safety or the environment. The protection of health, safety and the environment is a companywide responsibility of workers at all levels.

## Creating Value Roadmap

In 2013, Ford published Policy Letter 25, which institutionalizes our “Creating Value Roadmap” – including the Business Plan Review and Special Attention Review processes – as standard practice for all business units throughout the company. Previously these processes had been used only at the most senior level of the company. The broad use of these management processes helps to ensure that the assessment of risks and opportunities – including sustainability-related risks and opportunities – is fully integrated into how we run the business. These processes also establish stronger accountabilities for tracking and reporting progress against goals and strategies, including those relating to sustainability. See [Key Business Processes for Integrating Sustainability](#) for more information.

## Privacy

The trust and confidence of our customers are important to us and essential to building long-term relationships and delivering excellent products and personalized services. We recognize that customers, employees and others have concerns about privacy and expect us to protect and handle personal information responsibly.

Ford is committed to implementing responsible privacy and data-handling practices. The company’s privacy-related Policy Letters and related Directives are designed to ensure the continuing trust and confidence of individuals who entrust us with personal information.

Meanwhile, Ford Motor Credit Company has a policy regarding customer information and privacy and uses systems and procedures to maintain the accuracy of customer information and to protect it from loss, misuse or alteration. Ford Credit provides training and communications to educate personnel about privacy requirements. Beyond protecting customer privacy, Ford Credit continuously works to provide a superior service experience, including programs offering payment deferrals following natural or other disasters. The company is a member of the Identity Theft Assistance Center, a nonprofit organization whose members offer free services to their customers. Member companies work with each other and with law enforcement to help victims and protect consumers from identity theft.

## Social Media Interactions

We encourage responsible employee participation in social media – such as Facebook, Twitter and Instagram, as well as blogs and other web-based discussion forums – and have developed a set of digital participation guidelines for our employees. A [version of the guidelines is available publicly](#) (pdf, 277kb). We also use online training to educate our nonmanufacturing work force about the use of social media and the need to communicate honestly and respectfully in connection with our business.

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- > [Sustainability Governance and Management Structures](#)
- > [Ethical Business Practices](#)
- > [Sustainability Management](#)

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# Ethical Business Practices

Our Corporate Compliance Office ensures that Ford has a comprehensive program to promote the company's culture of compliance and ethics within our dynamic global business.

The Corporate Compliance Office is part of Ford's Office of the General Counsel and works with many other areas of the company to ensure an effective compliance program. Our compliance program is overseen by a committee of senior management and the Audit Committee of the Board of Directors.

The compliance program raises awareness of the company's commitment to ethical practices, helps define corporate guidelines to operations through Policy Letters and Directives, ensures an infrastructure that allows for the reporting of policy violations or business-related legal violations through a number of avenues worldwide, oversees the investigation of such reports, conducts legal risk assessments, and provides training and education on key legal and ethical risk areas. The Corporate Compliance Office works with outside consultants to review different aspects of the compliance program and implements appropriate improvements. The company's Code of Conduct Handbook and risk assessment process have been externally reviewed.

In 2014, the company added resources to the Corporate Compliance Office to support our significant growth in key markets. These additions ensure that we have a team of experienced attorneys leading our efforts in Dearborn, Michigan, and expert attorneys dedicated to compliance on the ground in Shanghai, Cologne, Dubai and Mexico City, with additional support from attorneys in other key countries. As the company established our newest region, Ford Middle East and Africa, we have put a special focus on establishing comprehensive compliance systems to address region-specific risks.

On this page:

- ↓ Training
- ↓ Reporting Violations
- ↓ Anti-Bribery/Anti-Corruption

## Going Further the Right Way

As we continue to grow our business across the globe, we are making sure that ethics remain the foundation of all our business practices. In 2014, Ford's Corporate Compliance Office introduced a communication campaign to highlight our focus on these core values to our personnel around the world. Building on Ford's brand promise to Go Further, our compliance communication focuses on our internal commitment to "Go Further – The Right Way." This campaign includes ethics-related stories on our corporate internet homepage, video messages from our most senior executives, and in-person discussion from our CEO to the most senior leadership team during Ford's Global Leadership Meeting. Underlining senior management's commitment to compliance, the executive team's weekly business review meetings now begin with a slide focused on Going Further the Right Way and our company's commitment to ethics and transparency.

Our [Policy Letters and Directives](#) formally establish expectations for our employees and others working on behalf of the company, and our [Code of Conduct Handbook](#) (pdf, 1.01Mb) is the fundamental tool for communicating these expectations. The Code of Conduct

Handbook, our chief ethical guidance document, is a compilation of the most important and relevant Policy Letters, Directives and standards for Ford personnel. It is available in 14 languages. The online version, available to company personnel, includes active links to the original source documents, thus providing a single source for the relevant information.

## Training

To reinforce information contained in the Code of Conduct Handbook, we introduce new mandatory online training courses on a regular basis for our global nonmanufacturing employees and other targeted personnel. The courses focus on ethics, conflicts of interest, gifts and favors – topics on which we have long provided employee training – as well as touching on additional issues that have global applicability, such as bribery. Recent courses have also covered the topic of protecting personal and company information. A new Code of Conduct online training course was introduced in January 2015, and we are in the process of distributing it to our global workforce. As of late April 2015, more than 73,500 individuals, or approximately 70 percent of those invited, had completed the course.

## Smart Tools to Help Workers Go Further the Right Way

Ford's Corporate Compliance Office is working on innovative training and communication tools designed to make it even easier for our employees around the globe to comply with corporate policy and the law. In 2015, we released The Right Way app for smartphones to put answers to the most frequently asked ethics and compliance questions at our workers' fingertips wherever they are. The app covers topics including:

- Our human rights commitment and tips for identifying signs of human trafficking
- Our stance against harassment and discrimination
- Our strict policy against bribery and corruption in our business at all levels

We have made the app publicly available so that our supply chain and other business partners are able to use it and know Ford's ethical policies and commitments. As Ford's footprint continues to grow around the globe, our Corporate Compliance Office will continue to seek out innovative methods to ensure personnel know and embrace Ford's culture of ethics and compliance.



## Reporting Violations

Another component of our compliance program is an infrastructure that encourages and allows for the reporting of any potential violations of our Policy Letters and Directives and any violations of laws related to the business. Our nonmanufacturing workforce, including

contract personnel, are regularly reminded of their responsibility to report any known or suspected violation of the law or company policies. There are many ways for individuals to report such violations, including direct communications to a member of one of the control groups – such as the General Auditors’ Office, Human Resources, or the Office of the General Counsel – as well as telephone tip lines and email. These reporting pathways are also available in multiple languages. All of our plants have posters describing how our manufacturing workforce can centrally report potential violations.

All allegations of significance reported through these channels are reviewed by a cross-functional management committee with representation from Ford’s Office of the General Counsel, General Auditors’ Office, Human Resources, and Security. This committee oversees the investigations and resulting corrective actions or discipline. No retaliatory actions are allowed against individuals who report concerns about violations or cooperate in an investigation. We also assess compliance with our ethical standards through regular legal reviews that cover a range of topics relating to legal requirements and internal policies.

## Anti-Bribery/Anti-Corruption

Part of Ford’s philosophy as a company is to manufacture products close to where our consumers are located. We have 62 plants worldwide, and all of the countries in which these plants are located have their own business-related laws, with varying levels of enforcement and differing cultural norms. It’s essential to us that we conduct our business according to the highest ethical standards in every location in which we operate, and that we not acquiesce to local norms where those norms do not meet our standards. We have clear policies in place relating to bribery and corruption, as well as procedures for reporting any breaches of those policies.

In the past few years, we have strengthened the anti-bribery/anti-corruption portions of our Global Terms and Conditions for our production and nonproduction suppliers. We have been working with our joint ventures in Asia to enhance their anti-bribery policies. We have tested portions of our anti-bribery program at several global locations, to be sure our anti-bribery program is effective in each area of the globe. We also regularly train key individuals throughout the company – those who may encounter bribery or corruption issues in the course of their work – in how to recognize and avoid problems. All of our operations have been assessed for risks related to bribery and corruption, and we periodically review these assessments in light of our changing operations and laws. All of our board members and all workers who do not provide manufacturing labor in all of our operating regions receive general training on our anti-corruption and anti-bribery policies and procedures. We also provide more specific training to certain groups based on our assessment of possible risks for corruption and bribery.

Our anti-corruption training covers our policy against accepting bribes or workers taking advantage of their position at the company. The anti-bribery and anti-corruption training also includes our limitations on accepting gifts, favors and entertainment and the requirement that all nonmanufacturing employees must either report potential conflicts of interest, or attest (annually) that they do not have any conflicts of interest to report.

### READ MORE:

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# Sustainability Management

This section describes our systems for managing sustainability within our major business functions – Product Development, Manufacturing, Human Capital, and Vehicle Safety – and on the key sustainability issues of environmental and climate change management. (Our systems for supply chain management are discussed in the [Supply Chain](#) section.)

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# Product Development Governance

The development of our new products starts with an understanding of the consumer: who they are, how they live and what they want in a vehicle. Next comes the identification of advanced technologies and breakthrough ideas by our Research Labs and our Advanced Product Strategy, Advanced Marketing and Advanced Design groups. These and other groups work within an annual planning process to assess the latest developments in technologies and consumer trends to identify the best new technologies and anticipate the needs and desires of the marketplace.

Our product cycle plan defines timing for new or updated vehicles and the associated technology applications. Product development engineers, designers and product marketing teams work together to finalize a vehicle concept. Once the business case is approved, our vehicle programs are brought to market using our Global Product Development System, or GPDS.

The GPDS, launched in 2005, merges the best product-creation methods from all of Ford Motor Company’s global operations and is refreshed continually with the latest lessons learned as we develop new products. The GPDS provides a common set of milestones and metrics for the development of all vehicle programs across our regional business groups, which increases efficiency and quality.

As a part of this system, and as part of our One Ford global integration process, we require each vehicle to meet specific competitive and performance targets at every milestone along the product’s development path. These targets consider a wide range of environmental performance criteria, such as fuel economy, recycled materials and substances of concern. For example, our product carbon dioxide emission-reduction goal, coupled with a commitment to improve fuel economy, has been translated into fuel-economy targets for each new vehicle. 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, we have committed that for each of our new or significantly refreshed vehicles, we will offer a powertrain with leading fuel economy. We are following through on this commitment with vehicles introduced in 2014.

In addition, we have identified global leaders and attribute teams within Ford who coordinate the development of the global product attribute 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.

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- > Sustainable Materials Management
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# Sustainable Materials Management

Our sustainable materials strategy focuses on increasing the use of recycled and renewable materials and decreasing or eliminating undesirable materials. This section focuses on the management systems that support our sustainable materials efforts; for information on our overall approach to sustainable materials and our performance in this area, please see the [Sustainable Materials](#) section.

## Management Systems to Increase the Use of More Sustainable Materials

Since the early 1990s, Ford has had a Voluntary Recycled Content Usage Policy in North America, which sets targets for the use of nonmetallic recycled content in each vehicle and increases those targets year by year and model by model. Under this program, recycled materials are selected for all of our vehicles whenever technically and economically feasible. We are now developing sustainable materials requirements for new vehicle programs and significantly refreshed vehicle lines to increase their recycled and renewable content, and we are developing specific, numerical, model-over-model improvement targets. We pilot tested vehicle-level recycled-content targets with the 2014 Ford F-150. We plan to leverage learnings from that pilot to improve future target-setting processes and expand them across additional vehicle lines in the future.

We are also working with our commodity business planners, materials purchasers and materials engineers to develop a comprehensive list of cost-effective sustainable materials that can be implemented across multiple parts and vehicle lines. All recycled and renewable materials on this list are compared with virgin grades to ensure appropriate physical properties and component performance. By combining goals for updated or redesigned vehicles with identification and testing processes, we are standardizing and expanding the use of sustainable materials in our vehicles.

As we introduce sustainable materials, we do not assume that recycled materials are always the best solution. For example, we take into consideration whether recycled materials may increase vehicle weight or have significant energy demand in collection or recycling. We also have to balance our global materials strategy, which has dramatically reduced the number of materials we specify and use in order to maintain consistent quality and enable cost reductions, with the challenges of finding globally common recycled materials and recycled material feedstock. In some cases, the introduction of recycled and renewable materials runs counter to that commonization progress, since the feedstock for these materials can vary by region. For example, it is often more efficient to use materials made from local sources that divert waste from local landfills than to ship recycled-material

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- ↓ Management Systems to Increase the Use of More Sustainable Materials
- ↓ Management Systems to Eliminate Undesirable Materials

inputs across the globe. We are working to ensure that we use local materials as a feedstock for our recycled-content materials.

We have also developed 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 toward recycling targets. We are also working on specifications for renewable materials to make it easier for product engineers to incorporate renewable materials where we have found that they meet our performance standards.

We are continuing to develop and implement additional sustainable materials governance tools that build on our voluntary recycling standards and foster the development and implementation of more recycled and renewable materials. These include:

- **Developing guiding principles for incorporating recycled and renewable materials in our vehicles:** We have formed a cross-functional and globally integrated sustainable materials council to guide the sustainable materials strategy for the company. This informal team has developed a set of guiding principles to help us think through choices of materials. These principles, listed below, reflect our collective thinking on the most effective ways to increase the use of recycled and renewable materials in our vehicles:
  - Recycled and renewable materials will be selected whenever technically and economically feasible.
  - Recycled and renewable content will be increased year over year and model by model. Product quality, durability, weight, performance (material specification and/or part design verification) and economics will not be adversely impacted by the use of recycled and renewable content materials.
  - Tools and enablers will be provided to select, specify, track and validate the use of recycled and renewable materials.
  - Recycled and renewable materials will be used where there is evidence of reduced or improved life cycle impact.
  - Recycled materials will be used primarily in the market of origin, to minimize the carbon footprint.
  - Renewable content sourcing shall not compete with the food supply. Sustainable supply must be ensured (in terms of stable supply and sustainable growth).
- **Integrating recycled and renewable materials into the official strategies that govern materials and commodities purchasing:** We are developing global materials specifications that include recycled material specifications to facilitate greater use of these materials. Many commodity-purchasing plans already list recycled-content materials as a preferred material option, including those for battery trays, battery shields and wheel-arch liners. In addition, we developed a comprehensive resin strategy that requires the use of recycled plastics for underbody and aerodynamic shields, fender liners, splash shields, stone-pecking cuffs and radiator air-deflector shields manufactured in North America.
- **Adding recycled-content materials into our material-specification documents** where we have found that recycled materials meet our rigorous performance requirements. This makes it easier for component engineers and Tier 1 suppliers to choose sustainable materials by providing a direct comparison of their performance characteristics with an equivalent virgin material.

## Management Systems to Eliminate Undesirable Materials

More and more countries are adopting regulations governing the use of materials, chemicals and substances of concern, such as REACH (Registration, Evaluation, Authorisation and Restriction of CHemicals) a law passed by the European Union that is

being adapted and adopted in a wide range of other countries and states. We describe these materials regulations in the [Public Policy](#) section. Governments are also developing and implementing regulations governing the use of conflict minerals, which we discuss in the [Supply Chain](#) section. We are also increasingly aware of other materials of concern, including [rare earth elements](#). We have developed a range of management systems and tools to address materials of concern in our products.

For many years, Ford has been managing materials across the vehicle life cycle as part of our Global Materials Management Program. Ford has a **Restricted Substance Management Standard (RSMS)**, which was developed to reduce and eliminate the use of substances of concern in our vehicles and plants. The first of its kind in the industry, this standard was developed to address regulated substances as well as materials that Ford voluntarily chooses to eliminate from our vehicles and plants. The RSMS process is embedded in Ford's [Global Product Development System](#), our companywide vehicle design and production system.

We also work closely with our suppliers to ensure that they meet our materials requirements. We use a robust set of processes and tools to assist us in managing materials and substances internally and with suppliers, including the following:

- **The International Material Data System (IMDS)**, a reporting system used by multiple automakers and all tiers of suppliers. 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. Forty 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.

Ford vehicle programs use the IMDS to report 100 percent of materials and all the required substance data to fulfill or comply with all governmental regulations and requirements, including end-of-life vehicle directives in China, the EU, Japan, South Korea and Taiwan; REACH in the EU and other countries; and recent conflict mineral and other critical raw material reporting initiatives. The IMDS will also provide essential data and information needed to meet the incoming California Safer Consumer Products (green chemistry) Regulations and the Canadian Chemical Management Plan requirements.

- **Global Material Integration and Reporting (GMIR)**, a materials and substances tracking tool we developed for our engineers and suppliers. 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 our suppliers.
- **The Global Material Approval Process (GMAP)**, which handles all nondimensional materials (such as paint and adhesive) that are shipped directly to Ford plants. 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 simplifies the global materials approval process, saving time and ensuring better-quality data for complying with government regulations and Ford policies.

Ford is also working with other affected companies and industries to develop processes for collecting conflict minerals use and source information. Ford's existing materials management tools have been instrumental to our ability to collect and analyze information

about conflict minerals in our own products and supply chain. We are leveraging the IMDS to identify risks associated with conflict minerals and other critical raw materials. (See the Supply Chain section for more on Ford's approach to [conflict minerals](#).)

In response to the REACH legislation, Ford has developed additional systems to track and manage the use of chemicals. And, 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 task force. Ford is also the chair of the Chemical Management and Reporting Advisory Committee of the Automotive Industry Action Group (AIAG). Ford has also been co-chairing a newly formed industrywide and global Substance of Concern working group for automakers to work on eliminating undesirable chemicals.

Ford has made great progress in complying with REACH. For example, we created a REACH manager position and formed a REACH task force 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, for example, Ford conducted the "substances of very high concern" inventory studies required by REACH and generated all required reports for consumers and government 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 and that we will comply with REACH and similar regulations.

We have used our Global Materials Management (GMM) tools and processes to meet new requirements such as those in California's Safer Consumer Products (green chemistry) law. The "chemicals of concern" list recently published as part of that law was incorporated into our GMM tools for reporting and analysis. We will use the materials and substances data collected in our GMM databases for the Alternative Assessments required by California's new regulations.

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# Rare Earth Elements

“Rare earth elements” (REEs) are a set of 17 chemical elements in the periodic table. Though many of these elements are not actually rare, their geochemical properties make it difficult to find them in concentrated forms that can be extracted for use easily or economically.

REEs have been used in conventional internal combustion vehicles for many years in small quantities. However, electrified vehicles – including hybrids, plug-in hybrids and full electric vehicles – use larger quantities of REEs in magnets in their electric motors and in their more complicated battery systems. As electrified vehicle production increases, the importance of the supply and production of certain rare earth metals is growing in importance to automotive companies.

REEs pose both economic and sustainability challenges. The growing demand for REEs has called into question future supply and material costs. REEs are also a concern due to the geographic concentration of their supply and environmentally unsustainable mining practices.

## Ford’s Approach to Rare Earth Elements

Ford has taken a proactive approach to understanding and minimizing the issues associated with REEs in our vehicles. We began by assessing the amount of REEs in our vehicles and where they occur. This is, in fact, a very challenging task, because REEs are used in small quantities, in a large number of components, and by suppliers far upstream in the supply chain. We estimate that approximately 0.44 kg of REEs are used in a typical conventional sedan, with approximately 80 percent of the rare earth content in permanent magnets used for speakers and electric machine actuators. Conventional vehicles primarily use neodymium, which is used in magnets, and cerium, which is used mainly in catalytic converters. Relatively larger amounts of REEs – primarily neodymium (Nd) and dysprosium (Dy) – are used in full hybrid electric vehicles (HEVs). A typical HEV sedan with a nickel-metal-hydride battery uses approximately 4.5 kg of rare earth metals. HEVs with lithium-ion batteries contain approximately 1 kg of REEs.

We have assessed the likely use of REEs in a variety of cleaner energy and vehicle future scenarios that meet the goal of climate stabilization, based on maintaining atmospheric carbon dioxide (CO<sub>2</sub>) at 450 ppm. Use of REEs will increase significantly as more electrified vehicles and wind energy generators are used, as these technologies use much higher amounts of Nd and Dy. Specifically, our studies suggest that, in the absence of efficient reuse and recycling, or the development of technologies that use lower amounts of Dy and Nd, there could be a large increase in demand for these elements.

Our primary focus in addressing REEs thus far has been to reduce the need for them in our electrified vehicle battery systems. Our third-generation hybrid system significantly reduces the use of REEs compared to nickel-metal-hydride batteries and other lithium-ion battery systems. The new system is also approximately 50 percent lighter and 25 to 30

percent smaller than previous-generation hybrid batteries, contributing to better fuel efficiency. We expect this new hybrid battery technology will save up to 500,000 pounds of rare earth metals annually.

Also, we have reduced the use of Dy by approximately 50 percent in the electric machine permanent motor magnets used in our hybrid system. This new technology reduces the magnet cost by approximately 30 percent, largely by reducing the use of Dy, which is the most expensive REE used in electric motor magnets.

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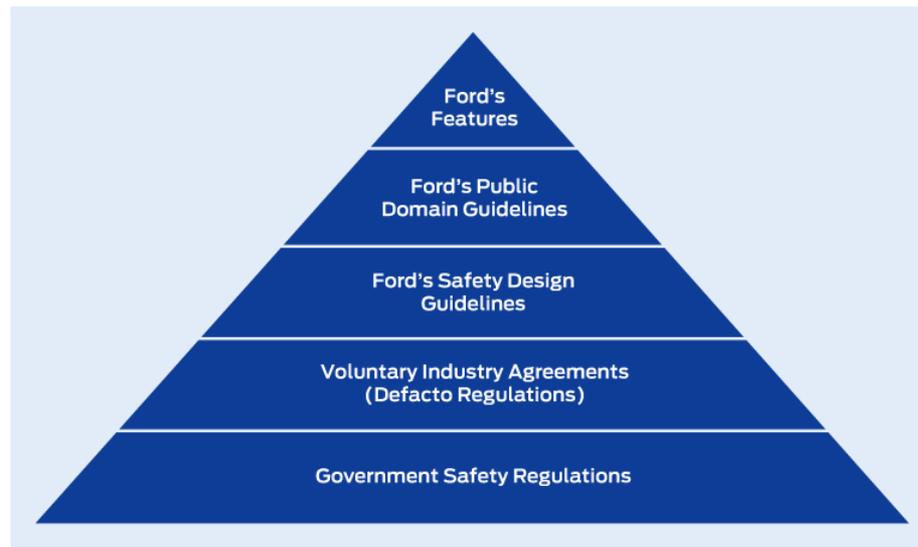
# Vehicle Safety

At Ford, we design and manufacture vehicles that achieve high levels of vehicle safety for a wide range of people over a broad spectrum of real-world conditions.

Real-world safety data, driver behavior, research, regulatory requirements and voluntary agreements provide much of the input into our safety processes, including our safety design guidelines (SDGs). (See graphic below.) The SDGs are Ford's stringent internal engineering design guidelines that exceed regulatory requirements and define additional requirements that are not regulated. The Public Domain Guidelines (PDGs) are Ford targets that focus specifically on relevant public domain assessments (i.e., vehicle safety assessments performed by government or nonprofit entities). We re-evaluate our PDGs and SDGs regularly and update them as needed based on changes in regulations, technologies and other factors.

On this page:

- ↓ [The Haddon Matrix](#)
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Internally, Ford uses engineering analyses, extensive computer modeling, and crash and sled testing to evaluate the performance of vehicles and individual components. These rigorous evaluations help to confirm that our vehicles meet or exceed regulatory requirements and our own even-more-stringent internal guidelines. Our state-of-the-art crash-test facilities include the Safety Innovation Laboratory in Dearborn, Michigan, and the extensive crash-test facilities in Merkenich, Germany, and Dunton, England. We also operate a high-tech, full-motion driving simulator in Dearborn called VIRTTEX, for VIRTual Test Track EXperiment. Vehicle safety is overseen by our Vice President of Sustainability, Environment and Safety Engineering.

## The Haddon Matrix

We use the Haddon Matrix to take a holistic view of the factors that may affect vehicle safety. (The matrix was developed by William Haddon, a former administrator of the U.S. National Highway Traffic Safety Administration and also former president of the Insurance

Institute for Highway Safety.) The Haddon Matrix illustrates how traffic safety can be the product of complex interactions among the driver, the vehicle and the driving environment.

The Haddon Matrix is used to look at crashes in terms of causal and contributing factors, including human behavior, vehicle safety and the driving environment. Each factor is then considered in the pre-crash, crash and post-crash phases. In the pre-crash phase, the focus is to help avoid the crash. In the crash and post-crash phases, the primary objective is to help reduce the risk of injury to occupants during and after a collision. In the post-crash phase, for example, the goal is to minimize the amount of time that elapses between the crash and when help arrives.

	 HUMAN BEHAVIOR	 VEHICLE SAFETY	 ENVIRONMENT
<b>Pre-Crash</b> <i>Accident avoidance</i>	<ul style="list-style-type: none"> <li>• Research</li> <li>• Education</li> <li>• Advocacy</li> </ul>	<ul style="list-style-type: none"> <li>• Crash avoidance technologies</li> <li>• Security</li> </ul>	<ul style="list-style-type: none"> <li>• Road design for accident avoidance</li> <li>• Traffic control</li> </ul>
<b>Crash</b> <i>Occupant protection</i>	<ul style="list-style-type: none"> <li>• Technology and proper use</li> </ul>	<ul style="list-style-type: none"> <li>• Restraints</li> <li>• Structures that absorb and reduce crash energy and intrusion</li> </ul>	<ul style="list-style-type: none"> <li>• Road design for injury mitigation</li> <li>• Research</li> </ul>
<b>Post-Crash</b> <i>Injury mitigation</i>	<ul style="list-style-type: none"> <li>• Telematics</li> </ul>	<ul style="list-style-type: none"> <li>• Post-crash notification</li> </ul>	<ul style="list-style-type: none"> <li>• Emergency medical services</li> </ul>
<b>Examples of Ford Actions</b>	<ul style="list-style-type: none"> <li>• SYNC® technology</li> <li>• MyFord Touch® driver connect technology</li> <li>• MyKey®</li> <li>• Ford Driving Skills for Life</li> </ul>	<ul style="list-style-type: none"> <li>• Accident avoidance features</li> <li>• Rear inflatable safety belts</li> <li>• Roll Stability Control®</li> </ul>	<ul style="list-style-type: none"> <li>• Accident research</li> <li>• Development of “vehicle-to-infrastructure” communication systems</li> </ul>

## Public Domain Ratings

Safety regulations and public domain rating programs differ around the world, and they are constantly evolving in response to a variety of regional factors. The public domain rating programs that perform vehicle crash testing and other assessments regularly update their testing protocols and evaluation criteria to reflect the needs of the region. Over the past several years, these programs have significantly revised their vehicle rating systems and test protocols, making it increasingly difficult to achieve the highest ratings. The changes have also caused the test protocols to become even more inconsistent and divergent between regions. Some of the changes include the addition of new assessment items (such as different-sized dummies in different seating positions), different or more-stringent crash evaluation criteria and greater emphasis on accident avoidance and driver assist features. This means that for an identical car, achieving the highest rating in one region or evaluation program does not guarantee the same result in another region or program. The inconsistencies in these regional rating programs pose additional challenges for global automotive companies, like Ford, that design vehicles for multiple global markets. For example, the rapidly evolving public domain rating programs may require us to implement unique vehicle designs in different markets.

New Car Assessment Program (NCAP) systems are being launched in regions where they have not existed in the past. A Latin NCAP system, for example, has been implemented to rate vehicles in Mexico and South and Central America, and an ASEAN NCAP was launched in Malaysia.

Just as rating programs vary by region, so do regulations, road infrastructure, the competitive landscape and other factors that can influence real-world safety. We work to understand all of these variables and to offer safety features that meet the needs of the region. And we continue to invest in researching new technologies and innovations to prepare for future societal needs. We strive to make technology available on a wide range of our products as appropriate to meet region-specific needs. This approach promotes greater societal benefits through broad market acceptance of new technologies, which ultimately enhances real-world safety.

**READ MORE:**

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> [Vehicle Safety and Accident Avoidance](#)

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# Manufacturing

The Ford Production System (FPS) is a continuously improving, lean, flexible and disciplined common global production system that encompasses a set of principles and processes to drive a lean manufacturing environment. Key elements of the system include effective work groups, zero waste/zero defects, aligning global capacity with global market demand, optimizing production throughput, and using total cost to drive performance.

Each principle has a set of guidelines, or “measurables,” that help us to meet or exceed objectives. The measurables are deployed and tracked for every manufacturing location using the SQDCPME Scorecard, which keeps focus on the vital components of a sustainable business: Safety, Quality, Delivery, Cost, People, Maintenance and Environment.

Many processes have been put into place to support the FPS and the Scorecard, including SQDCPME metrics, internal process confirmations and FPS Best Practices. The Scorecard is reviewed regularly by management, and progress against SQDCPME targets is a factor in the performance reviews of all managers in the manufacturing chain of command, from site-level managers to Ford’s CEO. Also, each manufacturing employee has an annual performance review that is based on objectives that are derived from the Scorecard. Manufacturing’s Scorecard objectives are cascaded through each organization down to plant-floor employees at the beginning of each year, to create alignment on objectives and measures of performance throughout the Manufacturing organization.

Manufacturing is integrated with Product Development in the Global Product Development System (GPDS). Beginning early in a program, the GPDS includes deliverables for manufacturing that drive a consistent and reliable process, through the implementation of such requirements as efficient die construction practices, standard and current bill of process, manufacturing design specifications, modularity and complexity. The standard bill of process allows us to confirm that our operations include all of our global best practices, as well as effective failure mode avoidance and successful process quality control. Manufacturing Engineering utilizes computer-aided, or “virtual,” design for manufacturing, which is aligned with the GPDS milestones, to improve the efficiency and quality of vehicle assembly.

Manufacturing works within the Global Quality Operating System (QOS) to develop, measure and continuously improve robust processes. This work starts early in the product development cycle to ensure that our manufacturing facilities are able to achieve the metrics outlined on the Scorecard. By following the disciplined processes and deliverables of the GPDS, the FPS and the QOS, we are able to continue defect prevention and reduce “things gone wrong” and warranty spending using global design rules and the manufacturing standard bill of process.

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# Operations Environmental Management

Ford has an environmental Policy and environmental Directives that apply to our operations globally (see [Policies and Directives](#)). All Ford manufacturing facilities and product development functions are certified to ISO 14001, the leading global standard for managing environmental issues. In addition, we require 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.

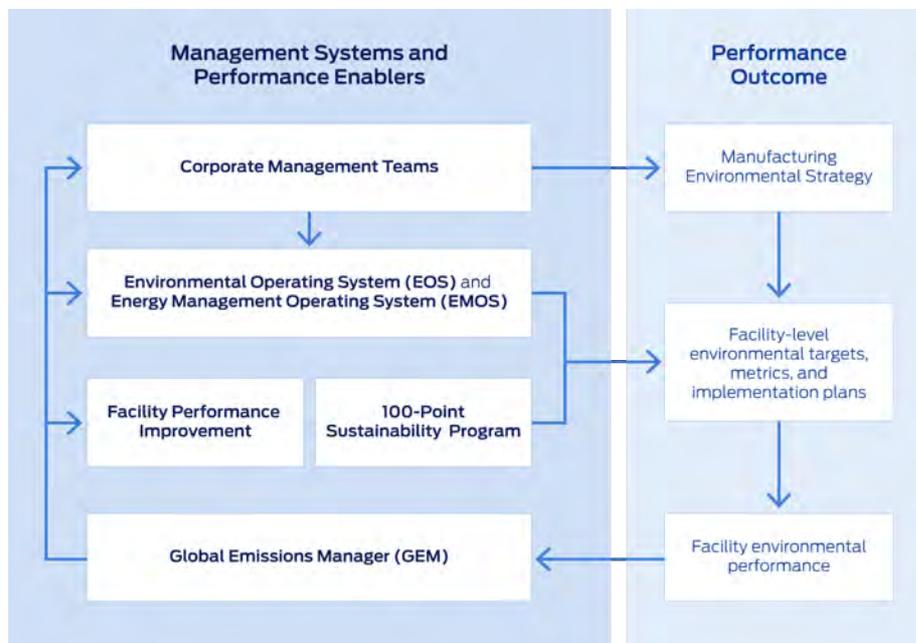
Ford has moved to a single-group ISO 14001 certification for our plants in North America. All plants and Ford Customer Service Division facilities in North America share this group certification. Likewise, all other regions (South America, Europe, Asia Pacific, and Middle East and Africa) share single-group certifications. Group certification saves time and money, with no degradation in plant environmental performance.

We have developed a series of tools and processes to manage environmental issues in our operations and help facilitate and measure progress on key issues, including energy use, water use, and waste generation and disposal. These tools help us accomplish four tasks that are central to advancing and measuring our progress on environmental issues:

- Setting corporate-, regional- and facility-level performance goals and targets
- Managing internal and external goals, targets and regulations
- Evaluating, standardizing and spreading the use of best practices across our facilities to help us meet performance goals
- Tracking performance using accurate and standard data to help us assess and improve performance

On this page:

- ↓ Corporate Management Teams
- ↓ Environmental Operating System
- ↓ Energy Management Operating System
- ↓ Global Facilities Forum
- ↓ Facility Performance Improvement
- ↓ 100-Point Sustainability Program
- ↓ Global Emissions Manager



## Corporate Management Teams

Our manufacturing management team translates our comprehensive global environmental targets into annual regional- and facility-level targets, which differ depending on the relevant regulations and financial and production constraints in each region. We develop our targets through a comprehensive process that considers past performance, future regulation trends, environmental technology advances, financial conditions and other relevant factors. Progress against these targets is reviewed regularly by all levels of management.

In addition to our global, companywide environmental performance goals, each Ford facility also has a comprehensive set of environmental targets and uses a detailed scorecard to report against these 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 executive vice president of manufacturing and labor affairs.

## Environmental Operating System

Managing Environmental Performance Goals, Targets and Regulatory Requirements

Ford's Environmental Operating System (EOS), which is fully integrated into the Ford Production System (FPS), provides a standardized, streamlined approach to maintaining compliance with all legal, third-party and Ford internal requirements, including government regulations, ISO 14001 and Ford's own environmental policies and business plan objectives and targets. This system allows us to manage an ever-increasing range of external regulations and internal performance objectives more effectively and with fewer resources. For example, the average plant has to comply with approximately 90 corporate requirements, 100 to 400 national regulations and 200 plant-specific requirements. The EOS consolidates all of these requirements into easy-to-follow tracking and reporting systems organized by recurring tasks, nonrecurring tasks and critical tasks. In addition to facilitating compliance with external regulations, the EOS also helps us develop and track internal environmental performance goals at the corporate, regional and facility level.

## Energy Management Operating System

Managing Energy-Related Goals, Targets and Performance Improvements

In 2013, we finalized the global rollout of our Energy Management Operating System (EMOS). We developed this system to provide a common and global structure to support and maintain energy-reduction actions, to achieve the corporate goal of improving global energy use per vehicle produced by 25 percent between 2011 and 2016. The EMOS is our mechanism for integrating energy-efficient principles into the facility design, manufacturing/engineering processes, and operations of Ford Manufacturing, Office and Engineering facilities. The system is aligned with our FPS and ISO 14000/50001 principles, and it leverages existing lean manufacturing principles, including Plan-Do-Check-Act (PDCA) protocols and Six Sigma tools.

Plant Energy Teams lead the implementation of the EMOS. At each plant, an energy management team develops a plant-level energy road map, which provides an overview of planned energy actions and a forecast of how well the plan will meet the corporate energy-reduction objective. As an input to the road map, the energy team performs an “energy health assessment,” which evaluates the plant’s operational performance, provides comparisons to other plants, and provides a list of best practices the plant can use to improve energy efficiency. Plant startup and shutdown processes are a key area of focus for energy teams, as these processes have significant impacts on plant energy use and provide major opportunities for energy use reduction. The team is also responsible for “energy opportunity evaluations,” which seek to identify additional opportunities to further improve energy efficiency beyond those provided in existing best practice lists. These additional efficiency opportunities could be based on peculiarities of the specific plant or they could be new ideas that contribute to future best practices that might be implemented in other plants as well.

The EMOS includes three other teams of people working cooperatively to support the work of the Plant Energy Teams:

- **Facility Changes.** This group is responsible for spreading best practices across Ford facilities by developing standards and specifications (for facilities and processes) that are used in planning for the future. This team also works to get the standards embedded into future product and project plans.
- **Data Management.** This group ensures robust and timely data for reporting and analysis to support the Plant Energy Teams and other decision-makers.
- **Energy Supply and Quality.** This group addresses energy purchases to ensure reliable and low-cost energy.

## Global Facilities Forum

### Developing Global Standards and Best Practices

In 2011, we established the Global Facilities Forum (GFF) to standardize processes for the construction and refurbishment of Ford facilities. The GFF includes representatives from Ford’s Environmental Quality Office, which oversees the environmental performance of Ford manufacturing facilities, and Ford Motor Land Development Corporation (“Ford Land”), which manages the construction of all Ford-owned facilities and the maintenance of Ford’s nonmanufacturing and commercial real estate facilities. The GFF also includes representatives from each of Ford’s operating regions.

Before the GFF was established, each region and operating group within Ford maintained its own set of standards, which made it more difficult to capture, record and spread best practices and lessons learned. The GFF develops and manages facility specifications and construction practices globally to achieve cost and sustainability objectives and spread best practices across our facilities. The GFF also prioritizes incorporating energy and sustainability objectives into building standards. Another key improvement of the GFF is a focus on life cycle costs, not just first or implementation costs. This facilitates the implementation of many energy-efficiency and other environmentally preferable

strategies, as well as reducing total costs to the company.

This standardization of best practices, especially environmental best practices, is becoming increasingly important as Ford continues significant investments in new facilities in Asia and the refurbishment of existing facilities in the United States.

## Facility Performance Improvement

### Setting Goals and Performance Improvement Plans for Existing Plants

At our existing plants, we implement year-over-year, internal facility-level goals for environmental performance in key areas, including energy use, carbon dioxide (CO<sub>2</sub>) emissions, waste to landfill, and water, as well as volatile organic compound (VOC) emissions for assembly facilities and hydrocarbon use for powertrain facilities. Through this program we determine the Ford plant with the best performance in each of these areas and set annual improvement targets for other plants based on ultimately meeting this stretch goal. In addition to setting internal facility goals, we also develop a road map for each facility to help them meet these goals. As part of this “roadmap” for improvement, we identify best practices plants have used to achieve their excellent performance, we evaluate these best practices for replication at other facilities, and we communicate best practices through a “single point lesson” system. This process was fully implemented globally in 2014.

## 100-Point Sustainability Program

### Setting Goals and Performance Improvement Plans for New or Refurbished Plants

We use a 100-point sustainability program to incorporate environmental performance best practices into new plants, plants that are being renovated for new vehicle programs, and plants that are otherwise being refurbished. We have established a rating system for each plant for each of several key environmental areas – energy, CO<sub>2</sub> emissions, water, and waste to landfill, as well as VOC emissions for assembly facilities and hydrocarbon use for powertrain facilities – and a rating for each major action taken to achieve performance improvements in these areas. These initial ratings provide a baseline for future improvements and a way to prioritize different improvement actions. We then set point-based improvement targets for these plants. The targets include a road map of specific actions to reach the sustainability point targets for each area.

## Global Emissions Manager

### Measuring Performance to Track Progress

We continue to use 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, CO<sub>2</sub> 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. GEM also provides a library of environmental regulations relevant to each plant, significantly increasing the efficiency of tracking and meeting those regulations. We continue to add metrics and tracking systems to GEM to further enhance our environmental management objectives.

#### READ MORE:

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> [Greening Our Operations](#)



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# Water Management

In 2014, we adopted a [comprehensive, holistic water strategy](#) based on the CEO Water Mandate. As part of this strategy, we developed management systems for water issues that go all the way to the highest levels of our company.

The Board of Directors reviews our water-related progress annually. A cross-functional team from across Ford divisions – including our Environmental Quality Office and our Manufacturing, Purchasing, Research, and Community Relations functions – reviews water issues in a holistic way. In recent years, Ford has also been meeting with a variety of external groups – such as the Interfaith Center on Corporate Responsibility, the UN Global Compact, the U.S. State Department, Ceres and the Global Water Challenge – to gain a better appreciation of outside stakeholder perspectives.

Since 2011, we have managed water reduction actions through our Environmental Operating System (EOS), which provides a globally standardized, streamlined approach to meeting all environmental requirements, including sustainability objectives and targets.

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# Climate Change Governance

The climate change issue is managed through governance systems at all levels of the company. The Sustainability Committee of our Board of Directors regularly reviews Ford's actions related to climate change.

Our plans for addressing climate change – whether relating to our products, facilities or policies – are highlighted and agreed to at the highest levels of Ford's executive management through the Business Plan Review process. Related emerging issues are reviewed as needed in Special Attention Review meetings. In addition, strategic product direction related to climate change goals is provided by a senior executive committee, made up of vice president and executive stakeholders, who guide the development of the vision, policy and business goals.

Related executive planning teams are responsible for developing detailed and specific policy, product and technical analyses to meet objectives. These teams base their plans on scientific data and promote actions that will help achieve the company's environmental ambitions, recognizing the need to use a holistic approach to effectively protect the environment. Metrics have been established and are reviewed regularly to ensure satisfactory progress. We have also developed strategic principles to guide our approach.

### READ MORE:

- |  |  |  |
|--|--|--|
| <p><i>We have a comprehensive, science based strategy for doing our part to reduce climate change</i></p> <p>&gt; <a href="#">Ford's Climate Change Strategy</a></p> | <p><i>We are making progress on our vehicle CO<sub>2</sub> reduction goals in all of our regions</i></p> <p>&gt; <a href="#">Vehicle Fuel Efficiency and CO<sub>2</sub> Emissions Progress and Performance</a></p> | <p>&gt; <a href="#">Sustainability Governance and Management Structures</a></p> <p>&gt; <a href="#">Climate Change</a></p> |
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# Human Capital Management

This section describes key elements of our human capital management processes, including our diversity, equal opportunity and anti-discrimination policies; our worker health and safety governance processes; and how we manage working conditions in our plants.

On this page:

- ↓ Diversity and Anti-Discrimination Policies and Grievance Procedures
- ↓ Health and Safety Governance
- ↓ Managing Working Conditions in Ford Plants

## Diversity and Anti-Discrimination Policies and Grievance Procedures

Ford Motor Company is an equal opportunity employer committed to a diverse and inclusive workforce. We have longstanding policies clearly stating that discrimination or harassment in the work environment because of race, religion, color, age, sex, national origin, disability status, sexual orientation, gender identity or protected veteran status is a violation of the company’s nondiscrimination policies, and Ford has a commitment to zero tolerance of this type of behavior. These policies apply to all personnel, including part-time and supplemental employees and agency resources. Ford understands its responsibility to foster a respectful work environment free of harassment or discrimination at all levels of the organization. We take this responsibility seriously, and we thoroughly investigate any claim of violation.

Our collective bargaining agreements address this issue and allow union-represented employees the right to use the grievance process. Ford’s Code of Human Rights, Basic Working Conditions and Corporate Responsibility (Policy Letter 24) directly addresses the issue of respect and inclusion, as do the following additional global Policies and Directives:

- Local Equal Employment Opportunity Policy Statement
- Policy Letter 2: Relationships with Employees
- Policy Letter 6: Equal Opportunity and Affirmative Action
- Directive B-110: Anti-Harassment/Zero Tolerance

Across the globe, a number of internal avenues are available to employees who wish to make and/or document a complaint. These processes are communicated to all employees through the Open Door policy, which is explained in Policy Letter 2, and through various policies posted online. The Open Door process, available to all employees, facilitates the resolution of work-related issues. These avenues include:

- Reporting the incident or concern to a supervisor or any other member of management
- Filing a complaint with the local human resources office
- Contacting the human resources representative at the division office or Personnel Relations at World Headquarters in Dearborn, Michigan
- Calling a hotline, through which concerns may be raised
- In the U.S., using peer review, which is an internal alternative dispute resolution

process

In the U.S., Ford believes that U.S. Equal Employment Opportunity Commission and other civil rights agencies would agree that our relationship with them has been both longstanding and strong. We stand committed to cooperating with those civil rights agencies that provide resources to the people of our diverse communities in an effort to eliminate discrimination and harassment in the workplace.

Within the U.K. we have a robust, comprehensive Dignity at Work policy that sets out the expected standards of behavior and what steps can be taken if there are infringements of these high standards. All employees are trained on the content of the policy, with further training for supervisors and managers who investigate allegations of harassment and/or bullying.

Also see:

> [Diversity and Inclusion](#)

## Health and Safety Governance

We have comprehensive governance systems for health and safety management. Our overarching Occupational Health and Safety (OHS) policy is established through a corporate Policy Letter and Directives. In addition, global OHS standards cover all health and safety topics, including safety, ergonomics, occupational hygiene, toxicology and clinical operations.

Often the most efficient and cost-effective way to reduce safety and ergonomic risks in the manufacturing process is to engineer them out upfront. Our global manufacturing engineering teams use the latest technology of “virtual manufacturing” to predict and eliminate risks during the design stage. We also have a global process to ensure that [all materials](#) used in our factories are safe for our people.

We review safety regularly at the plant level and in regional OHS committees. Our president and CEO, and our senior operating team, review safety performance as part of their regular business plan reviews, as does the global Manufacturing Operating Committee.

Within manufacturing, we use an assessment process that is aligned with the Ford Production System. The process includes an integrated assessment that evaluates safety, quality, delivery, cost, people, maintenance and environmental operating systems, while recognizing their interdependencies.

Nonmanufacturing sites conduct yearly self-assessments of their OHS risks and performance. All sites must respond to a series of safety questions that have been integrated into the Ford General Auditor’s Office basic audit review program.

All of these assessment mechanisms provide [data on our health and safety performance](#) that demonstrate our progress toward our goals and help to identify areas for further advances. We adjust our approach to achieve continuous improvements. Several recent adjustments are described in the [Health and Safety](#) section of this report.

Most of our manufacturing facilities have joint union/management safety committees that guide the development and implementation of safety programs in their operations. At least 75 percent of the company’s workforce globally is covered by local health and safety committees. This includes the entire manufacturing workforce and some staff organizations.

## Managing Working Conditions in Ford Plants

Ford's Policy Letter 24, our Code of Human Rights, Basic Working Conditions and Corporate Responsibility, applies to our own facilities as well as those of our joint venture partners and suppliers. We began doing formal assessments of Ford and joint venture facilities globally in 2004. In 2014 we conducted four assessments across our operating regions; we plan to undertake assessments of four different plants in 2015.

Sites are selected for assessment by Ford's Sustainability and Vehicle Environmental Matters (SVEM), Global Labor Affairs, and Purchasing Supply Chain Sustainability functions based on the site's impact on our supply chain, emerging issues, and the views of thought leaders, nongovernmental organization representatives and human rights activists.

The process for assessing Ford facilities includes a questionnaire completed by facility management and a detailed review of documents related to the full range of working conditions issues (e.g., collective bargaining agreements, grievance procedure logs, employee hotline records and health and safety audit reports).

The findings of the questionnaire and document review serve as the basis for interviews with facility management. Where procedures and/or documentation are lacking, or where we feel it would otherwise be valuable, the assessments also include facility visits.

The findings of the assessments are initially shared with human rights organizations with which Ford works and are then published within this [Sustainability Report website](#). We have sought the opinions of neutral third parties who have visited plants and/or reviewed the assessment process, and they have agreed that the process is robust and has integrity.

The findings of the past assessments have confirmed that Ford's wholly and majority-owned facilities are operating in compliance with Policy Letter 24.

We continue to receive positive feedback from external stakeholders about the policies and systems in place at Ford facilities. While we and our stakeholders have confidence in our systems, we nonetheless believe it is important to continue conducting the assessments given that conditions can change and new issues emerge.

#### READ MORE:

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*We are also working with our suppliers on working conditions and human rights*

> [Human Rights and Working Conditions in Our Supply Chain](#)

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# Public Policy

Every day, government officials around the world make decisions that impact Ford. As a global automotive company, it is important that we have a voice in policies that affect our business in the countries in which we operate, and that Ford be recognized as a credible, leading source of information as those policies are formulated.

Across a range of issues – including manufacturing, climate change, energy security, human rights, trade, tax policies, education and vehicle safety, among others – we strive to be part of the solution by supporting policies that are economically, environmentally and socially sustainable for Ford our customers and their communities. Informed policy makes for better policy, whether at the international, national, regional, state or local level.

*In this section:*

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# Participation in the Policy-Making Process

Ford seeks to be an active participant in the political process in a manner that is transparent and supports our business interests. On issues of highest priority for us, we stay in regular contact with legislators and regulatory officials in our major markets, to share with them our interests and perspectives and offer expert input into the policy-making process. Our Government Affairs offices, aligned with our business operations around the world, oversee these lobbying activities.

## Membership in Coalitions and Associations

Ford belongs to a broad range of partnerships and coalitions, as well as industry and trade associations (such as the Alliance of Automobile Manufacturers), that advocate for legislation and regulation on behalf of their members. Working with others in these types of organizations enables Ford to better leverage our resources on issues of importance to us, and to develop and promote policies that have potentially far-reaching benefits for industry and society.

Of course, we do not always agree with every position taken by these organizations. In cases where we don't agree, we have to determine if, on balance, we agree with enough of the organization's positions that we should continue to engage with them. And, we always reserve the right to speak with our own voice and make our own positions clear, even when they may not align with the positions of associations to which we belong.

## Ford Policy on Political Contributions

Ford Motor Company does not make contributions to political candidates or political organizations as a matter of policy, but may do so in limited cases in some non-U.S. countries where it has operations. Company resources are not employed for the purpose of helping elect candidates to public office, even when permitted by law. Nor do we take positions for partisan political purposes – that is, specifically for the purpose of advancing the interest of a political party or candidate for public office. These policies remain unchanged, notwithstanding the U.S. Supreme Court's January 2010 decision that loosened restrictions on corporate independent expenditures.

With proper executive approval, Ford may contribute to support or oppose a U.S. state or local ballot proposal, if such contributions are permitted by law and if the issue is of significant interest or importance to the company. Information with respect to contributions made in connection with ballot questions and referenda is publicly available through the appropriate local or state reporting authorities.

We do encourage employees to participate in political and governmental affairs, and we recognize that company efforts and programs to encourage employee participation must

fully respect the right of employees to use personal time as they choose and to decide the extent and direction of their political activities. The Ford Motor Company Civic Action Fund (the “Ford PAC”), which is supported by voluntary donations from Ford employees, gives campaign contributions to national, state and local political candidates from both major political parties in the U.S. The company pays the solicitation and administrative expenses of the Ford PAC, which are minimal, as permitted by law.

All contributions made to the Ford PAC and all distributions from the Ford PAC are in compliance with Federal Election Commission (FEC) and applicable state regulations. A list of the Ford PAC’s contributions made during 2014 can be found at the FEC website.

Decisions about political contributions by the Ford PAC are made by Ford’s Governmental Affairs office, in accordance with business objectives that support our competitiveness in the global automotive industry. Ford PAC contributions are used to support issues directly related to manufacturing and Ford business objectives. All Ford PAC candidate contributions in excess of \$3,000 must be approved by the Ford PAC Political Contributions Committee, an eight-member, cross-functional group of Ford employees representing a range of organizational levels.

Ford complies fully with all laws and rules governing our employees’ interactions with officials at all levels of government (federal, state and local). Furthermore, all of our contact and dealings with government officials must also comply with our global corporate Policies and Code of Conduct. Note that under federal law, foreign nationals are prohibited from making contributions in connection with any U.S. election and are thus not eligible to join the Ford PAC.

**READ MORE:**

[> Public Policy Positions](#)

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# Public Policy Positions

This section summarizes Ford’s positions on key public policy issues currently under discussion in the regions where we operate. Our [positions and efforts regarding conflict minerals](#) are discussed in the Supply Chain section.

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- > Climate Change and Fuel Economy
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# Climate Change and Fuel Economy

All sectors of society – including the automotive industry – have important roles to play in achieving climate stabilization. At Ford, we take this responsibility seriously. We have based our global approach to product planning and policy participation on the science of climate stabilization and on doing our part to reduce emissions significantly in order to maintain atmospheric concentrations of greenhouse gas emissions (GHGs) at or below 450 parts per million (ppm).

Also see:

- > [Ford's Climate Change Strategy](#)
- > [Developing Our Stabilization-Based Climate Change Strategy and CO<sub>2</sub> Reduction Targets](#)

We are committed to working with all key stakeholders to promote climate change policy that helps to align vehicle technology, fuel technology and availability, and consumer demand to effectively reduce transportation sector emissions and reach climate stabilization goals. We welcome – and have worked to promote – comprehensive, market-based policy approaches that provide a coherent and effective framework for GHG emission reductions and give companies in all sectors a clear understanding of their role in achieving reductions.

Clarity and consistency in fuel economy and vehicle GHG regulations is critical to our ability to plan, develop and bring new products to the marketplace. These regulations effectively determine what vehicles we are allowed to build and sell, irrespective of what consumers may be willing to embrace and regardless of whether the assumptions underlying the regulations ultimately prove to be correct.

At the same time, light-duty trucks and passenger vehicles represent only about 12 percent of all global fossil fuel carbon dioxide (CO<sub>2</sub>) emissions,<sup>1</sup> so our industry alone cannot achieve climate stabilization. It will require major efforts by all sectors of society: industries, governments and consumers. And, even reducing the transportation sector's contribution to climate change cannot be done by automakers alone. It will require a partnership of all stakeholders, including automakers, the fuel industry, governments and consumers. That's because effectively reducing emissions will require not only improving vehicle fuel economy, but also developing lower-carbon fuels, infrastructure to deliver those fuels, and government actions to encourage consumers to purchase these more fuel-efficient vehicles and operate with lower-carbon fuels.

In our major markets, the regulation of fuel economy and/or vehicle CO<sub>2</sub> emissions is increasingly complex and regionally unique. For instance, regulations in each region of the world differ in the emissions standards they set and the testing procedures for ensuring compliance with those standards. The primary testing procedures are those developed by the U.S. Environmental Protection Agency (EPA), the European Union, and Japan, while China is electing to create unique requirements. The units of measurement for testing may

be miles per gallon, grams of CO<sub>2</sub> per kilometer, kilometers per liter, or megajoules per kilometer, depending on the country.

In addition to the regulatory process that defines emission standards, some governments are taking diverse approaches to incentives for emission reductions through rebates, fees, “feebates,” privileges for low-emitting vehicles and penalties for high-emitting vehicles. At the same time, some U.S. state governments are even introducing registration taxes for plug-in hybrid electric vehicles (PHEVs) and battery electric vehicles (BEVs), to make up for the loss in highway fund revenues resulting from these vehicles’ reduced use of conventional fuels.

Globally, the situation is even more diverse. In Europe, some countries incentivize low-CO<sub>2</sub> vehicles via the tax system. In Norway and the Netherlands, for example, BEVs are exempted from registration taxes. Further measures to support replacing the existing vehicle fleet with more efficient and clean new vehicles in Europe include scrappage schemes for older cars, standardized CO<sub>2</sub> labeling on new cars to provide better information to customers, and individual Ultra Low Emission Zones in some cities, such as London and Paris.

This very complex policy environment is one important driver of our strategy to develop fuel-efficient and advanced-technology platforms that can be shared globally and tailored to the needs of our customers. Customer vehicle-purchasing choices are affected by vehicle incentives, fuel costs, annual registration costs and overall maintenance and ownership costs.

#### READ MORE:

<p>In this section:</p> <ul style="list-style-type: none"><li>&gt; <a href="#">North America Policy</a></li><li>&gt; <a href="#">Europe Policy</a></li><li>&gt; <a href="#">Asia Pacific Policy</a></li><li>&gt; <a href="#">South America Policy</a></li><li>&gt; <a href="#">Middle East and Africa Policy</a></li><li>&gt; <a href="#">Renewable Fuels Policy</a></li></ul>	<p><i>We have a comprehensive, science based strategy for doing our part to reduce climate change</i></p> <ul style="list-style-type: none"><li>&gt; <a href="#">Ford's Climate Change Strategy</a></li></ul>	<p><i>We are making progress on our vehicle CO<sub>2</sub> reduction goals in all of our regions</i></p> <ul style="list-style-type: none"><li>&gt; <a href="#">Vehicle Fuel Efficiency and CO<sub>2</sub> Emissions Progress and Performance</a></li></ul>
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1. International Energy Agency, *Energy Technology Perspectives 2014* (Paris, France: International Energy Agency, 2014). ETP2014 transport summary and scenario summary online data.

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# North America Policy

## U.S. Greenhouse Gas and Fuel Economy Policy

In the U.S., the U.S. Environmental Protection Agency (EPA) regulates greenhouse gas (GHG) emissions from mobile sources using their authority under the Clean Air Act, while the U.S. National Highway Traffic Safety Administration (NHTSA) regulates motor vehicle fuel economy.

In 2010, the EPA and NHTSA jointly promulgated regulations establishing the “One National Program” of corporate average fuel economy (CAFE) and GHG regulations for light-duty vehicles for the 2012–2016 model years. In 2012, the EPA and NHTSA jointly promulgated regulations extending the One National Program framework through the 2025 model year. These rules require manufacturers to achieve, across the industry, a light-duty fleet average fuel economy of approximately 45 mpg by the 2021 model year, and approximately 54.5 mpg by the 2025 model year. Each manufacturer’s specific task depends on the mix of vehicles it sells. The rules include the opportunity for manufacturers to earn credits for technologies that achieve real-world carbon dioxide (CO<sub>2</sub>) reductions, as well as for fuel economy improvements that are not captured by EPA fuel economy test procedures. Manufacturers also can earn credits for GHG reductions not specifically tied to fuel economy, such as improvements in air conditioning systems.

The rules specify a midterm evaluation process under which, by 2018, the EPA will reevaluate its standards for model years 2022 to 2025 to ensure that those standards are feasible and optimal in light of intervening events, taking into account previously assumed consumer and market conditions. In parallel, NHTSA will undertake a process to promulgate final CAFE standards for those model years. Ford plans to participate in the midterm evaluation process.

It is important to note that the One National Program standards become increasingly stringent over time, and they will be difficult to meet if fuel prices remain relatively low and market conditions do not drive consumers to purchase electric vehicles and other highly fuel-efficient vehicles in large numbers. We are particularly concerned about the commercial feasibility of the 2022–2025 model year GHG and CAFE standards, and therefore the midterm evaluation process is very important to Ford and the auto industry. Ford’s ability to comply with the 2022–2025 model year standards remains unclear because of the many unknowns regarding technology development, market conditions, and other factors so far into the future. If the agencies seek to impose and enforce fuel economy and GHG standards that are misaligned with market conditions, we likely would be forced to take various actions that could have substantial adverse effects on our sales volume and profits. Such actions likely would include restricting offerings of selected engines and popular options; and ultimately curtailing the production and sale of certain vehicles such as high-performance cars, utilities, and/or full-size light trucks, in order to maintain compliance.

On this page:

- ↓ [U.S. Greenhouse Gas and Fuel Economy Policy](#)
- ↓ [Canadian Greenhouse Gas Policy](#)
- ↓ [Mexican Greenhouse Gas Policy](#)

Ford views the continuation of the One National Program agreement as a positive step for all stakeholders toward our common goals of energy security and reduced greenhouse gas emissions. A national program is essential for the efficient regulation of motor vehicle fuel economy and GHG emissions. It allows manufacturers to average the fuel economy and CO<sub>2</sub> emissions of their vehicles based on nationwide sales, which in turn enables manufacturers to formulate their product plans on a national level to achieve the necessary scale for future technology introductions. In contrast, state-by-state or regional regulations could force manufacturers to restrict the sale of some products in certain parts of the country, harming both consumers and dealers in those areas. Since CO<sub>2</sub> emissions do not create localized air-quality problems, state or regional standards are unnecessary and would create hurdles, added costs and market disruptions in our path toward achieving reductions. Should California or other states ever renew their efforts to enforce state-specific motor vehicle GHG rules, this would impose significant costs on automotive manufacturers.

We intend to work closely with the EPA, NHTSA and other key stakeholders, including California, throughout the midterm evaluation process to ensure continued alignment between our shared goals for the environment and market realities of consumer acceptance of new advanced technologies.

For the longer term, Ford supports a legislative solution codifying the One National Program approach beyond 2025, to head off the possibility that various agencies or individual states may promulgate and enforce multiple, inconsistent fuel economy and/or GHG regulations in the future.

## **U.S. Heavy-Duty Vehicle Fuel Economy Regulations**

In 2011, the EPA and NHTSA promulgated final regulations imposing, for the first time, GHG and fuel economy standards on heavy-duty vehicles (generally, vehicles over 8,500 pounds gross vehicle weight rating). These initial regulations cover the 2014 to 2018 model years for heavy-duty trucks, buses and vans. The regulations cut emissions by improving the fleet's fuel efficiency by 9 percent to 23 percent, depending on the size of the vehicle. In Ford's case, the standards primarily affect our heavy-duty pickup trucks and vans, plus vocational vehicles such as shuttle buses and delivery trucks. Ford supports the agencies' attribute-based approach to medium-duty pickup and van standards that acknowledges the physical demands placed on these work vehicles. The standards recognize that the various products offered have differing degrees of load-carrying, trailer-towing and off-road capability.

In February 2014, President Obama announced that the EPA and NHTSA will issue a new round of standards for these vehicles covering the 2019 model year and beyond. The draft regulations are expected by summer 2015. Ford is committed to working with the EPA, NHTSA and the California Air Resources Board (CARB) toward a feasible set of GHG requirements that takes into account our learnings from the implementation of the first round of requirements, the state of vehicle technology, the practical ability of manufacturers to integrate such technology into their vehicle fleets and engineering lead-time requirements. Such a national program will enable the U.S. to move forward toward its environmental objectives in an efficient and effective manner. These regulations are expected to be finalized by the spring of 2016. It is important to note that, as the heavy-duty standards increase in stringency, it may become more difficult to comply while continuing to offer a full lineup of heavy-duty trucks.

## **The Need for Broad Engagement on Climate Issues**

The potential impacts of climate change create an urgent need to transform the U.S. economy into one with lower greenhouse gas emissions, higher energy efficiency, and less dependence on fossil fuels and foreign oil. This transformation will require changes in all

sectors of the economy and society. A comprehensive framework is needed to spur these changes.

While Ford and the auto industry have led by supporting the rules proposed by the EPA and NHTSA (described above), regulations focusing on just one sector of the economy will not support overall CO<sub>2</sub> stabilization. We believe we need a comprehensive, market-based approach to reducing GHG emissions if the U.S. is going to reduce emissions at the lowest cost per ton. An economy-wide program would provide flexibility to regulated entities while allowing market mechanisms to determine where GHG reductions can be achieved at the lowest cost. The environment doesn't care where reductions occur, but the economy does, and given the potentially high cost of abatement, it is important to achieve the greatest reductions at the lowest cost possible.

Thoughtful and comprehensive national energy and climate policy that provides a price signal is needed to support the billions of dollars being invested in low-carbon and fuel-efficient vehicle technologies. In the absence of a cohesive policy that includes a price signal, regulations must be structured so as to ensure alignment with market realities and consumer behavior.

Ford will continue to lead in the development of advanced technologies and support comprehensive regulations that bring stakeholders together to help drive down GHG emissions and provide a framework for sound business and product planning.

## Canadian Greenhouse Gas Policy

In September 2010, Environment Canada finalized a GHG emission regulation for 2011 to 2016 model year passenger automobiles and light trucks that aligned emission standards and test procedures with those of the U.S. The regulation provides companies with similar compliance flexibilities to those available under the EPA's GHG regulation, including advanced technology credits, air conditioning leakage and efficiency credits, flexible-fuel vehicle credits and credit transfer among fleets. In October 2014, the Canadian government updated this regulation so that it would align with the EPA's GHG standards for the 2017 to 2025 model years.

In February 2013, Environment Canada published a final regulation for heavy-duty vehicles for the 2014 to 2018 model years. This rule aligns with the U.S. federal heavy-duty vehicle GHG regulations, which began with the 2014 model year.

The Provinces of Quebec, Manitoba and British Columbia participate in the Western Climate Change Initiative and had committed to adopt GHG regulations based on California standards. Quebec actually promulgated a GHG regulation based on the California standards, but with fewer flexibility mechanisms. Now that the Canadian federal regulation is in place, the Quebec government has amended the Quebec regulation to recognize equivalency with the federal standards. Quebec still requires reporting of fleet performance, however.

Ford is hopeful that Quebec will see the benefit of a single standard for Canada, consistent with the One National Program effort in the U.S. We have participated in regulatory discussions on this issue, providing technical expertise and supporting a tough, aligned, national standard. British Columbia and Manitoba have both acknowledged the value of the new federal standards.

Environment Canada also regulates renewable fuel content in on-road gasoline. Effective September 2010, renewable levels in the national pool of gasoline must average 5 percent. Environment Canada has also implemented a regulation for renewable content in diesel fuel. As of July 2011, the regulation requires 2 percent renewable content in diesel fuels.

## Mexican Greenhouse Gas Policy

Mexico has adopted fuel economy/CO<sub>2</sub> standards based on the U.S. One National Program framework. These standards took effect in 2014.

**READ MORE:**

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*We have a comprehensive, science based strategy for doing our part to reduce climate change*

> [Ford's Climate Change Strategy](#)

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*We are making progress on our vehicle CO<sub>2</sub> reduction goals in all of our regions*

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# Europe Policy

The European Union has set mandatory carbon dioxide (CO<sub>2</sub>) targets for both passenger cars (M1) and light commercial vehicles (N1).

The specific target for an automaker depends on the fleet average weight of the automaker's vehicles registered in a given year; lower average vehicle weight results in stricter CO<sub>2</sub> targets for a given automaker. Ford passenger cars registered in the EU have a lower fleet average weight compared to the rest of the industry, which results in stricter targets for Ford than the overall industry target of 130 g/km, which is being phased in from 2012 to 2015. This overall target is set to decrease to 95 g/km in 2020 and 2021 (with a 95 percent phase in in 2020).

Non-EU European countries are likely to follow with similar regulations. For example, Switzerland introduced similar rules, which began phasing in in July 2012 with more strict targets (and which also will likely include a 2020 target of 95 g/km), although the industry average emission target is significantly higher. The EU Commission, Council and Parliament also approved a target for commercial light-duty vehicles to be at an industry average of 175 g/km (with phase-in from 2014 to 2017) and 147 g/km in 2020. It is likely that other European countries, like Switzerland, will implement similar rules. In several EU member states, CO<sub>2</sub> taxation is in place to encourage the early introduction of low-CO<sub>2</sub> vehicles, with tax break points at certain levels. Unfortunately, these tax break points are not harmonized among European countries.

The EU has also established complementary measures governing other items related to climate change, such as fuels (including bio-blends), tires, gear-shift indicators, fuel economy indicators and air conditioning systems.

The United Nations has a project underway to develop a new harmonized test cycle regulation for passenger car and light commercial vehicles emissions and CO<sub>2</sub>, which will replace the current new European driving cycle (NEDC) test cycle. This new world light-duty test procedure (WLTP) is focused primarily on delivering more realistic CO<sub>2</sub> and fuel consumption figures. The introduction of the WLTP in Europe is likely to start with updates to CO<sub>2</sub> labeling beginning in 2019 and could lower certain consumer label values. Costs associated with new or incremental testing for WLTP could be significant. The European Commission continues to apply political pressure for mandatory WLTP testing for regulated emissions and CO<sub>2</sub> starting in September 2017. The Commission has assured equivalent stringency to the existing fleet average rules for each automobile manufacturer, if the 2020 fleet average targets are required to be measured using WLTP instead of under the current European requirements.

Some European countries have implemented or are considering other initiatives for reducing vehicle CO<sub>2</sub> emissions, including fiscal measures and CO<sub>2</sub> labeling. To limit GHG emissions, the EU directive on mobile air conditioning currently requires the replacement of the current refrigerant with a lower "global warming potential" refrigerant for new vehicle types, and for all newly registered vehicles starting in January 2017.

Overall, automobiles are one of the most regulated products in the EU, with requirements not only covering CO<sub>2</sub> emissions but also non-CO<sub>2</sub> air emissions, drive-by noise, recycling, substances, electromagnetic fields, safety, technical aspects and more. Ford is complying and will continue to comply with all these various targets and prohibitions with appropriate product offerings.

In general, we request that regulations and policies be well coordinated and not contradictory to each other, and that they also be technology-neutral, be proportional, avoid double regulation, offer sufficient lead time to adjust development and production cycles, and follow an integrated approach in which all stakeholders (industry, infrastructure, consumers and governments) contribute to the solution.

We are committed to continue to do our share to protect the climate. The automotive industry will continue to invest heavily in research and development and new product programs in order to reach short-term CO<sub>2</sub> targets. Through further continuous innovation, including improvements in our advanced gasoline and diesel technologies as well as electrified powertrains, we are working to reduce our fleet-average CO<sub>2</sub> by more than 20 percent to support the legally required 95 g/km in 2021. This long-term target will require technological breakthroughs, new refueling infrastructure and a swift renewal of the car fleet on Europe's roads. We also see the need for all industry and transport sectors to reduce CO<sub>2</sub> emissions in a similarly effective way. Post-2021 emission reduction requirements should factor in European economic realities and be more globally balanced to ensure that the competitiveness of the European auto industry is not adversely affected and that European consumers can still afford new low-CO<sub>2</sub> vehicles. We will work closely with the new European Commission, Parliament and member states towards a reasonable solution.

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*We have a comprehensive, science based strategy for doing our part to reduce climate change*

> [Ford's Climate Change Strategy](#)

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*We are making progress on our vehicle CO<sub>2</sub> reduction goals in all of our regions*

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# Asia Pacific Policy

In China, economic growth is a key priority of the Chinese government, to be balanced with energy security and air pollution reduction. The Chinese Ministry of Industry and Information Technology (MIIT) enforced a Stage III fuel-consumption monitoring and reporting rule beginning July 1, 2012. We are on track to comply with this requirement through 2015. The China Automotive Technology and Research Center (CATARC) has developed Stage IV fuel-consumption targets for the MIIT; the industry fleet Corporate Average Fuel Consumption targets are 6.9 L/100 km in 2015, decreasing to 5.0 L/100 km in 2020.

The Chinese government provides limited incentives for the purchase of “new energy vehicles” (including plug-in electric vehicles) that are made in China. The government also provides incentives of RMB60K (approximately \$9,700) per vehicle to customers who purchase plug-in or pure electric vehicle models approved as new energy vehicles.

India, Japan, South Korea, Taiwan and Vietnam have released new or modified fuel-economy limits, while Hong Kong, Japan, South Korea and Thailand have set or are developing complementary tax incentives based on fuel economy and carbon dioxide targets.

Ford is actively involved in dialogues with governments across Asia Pacific in a number of areas, including sustainable mobility, energy security and environmental protection.

### READ MORE:

*We have a comprehensive, science based strategy for doing our part to reduce climate change*

**> [Ford's Climate Change Strategy](#)**

*We are making progress on our vehicle CO<sub>2</sub> reduction goals in all of our regions*

**> [Vehicle Fuel Efficiency and CO<sub>2</sub> Emissions Progress and Performance](#)**

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# South America Policy

In Brazil, our largest South American market, the large-scale use of biofuels is a national policy. All gasoline is blended with 18 to 27 percent ethanol, and hydrous ethanol is extensively used as motor fuel. Most new vehicles are flexible-fuel vehicles, which are designed to accommodate fuel containing a range of ethanol content. Also, a minimum of 7 percent biodiesel must be added to diesel.

Brazilian emission requirements are periodically updated through an emissions-control program. Brazil also introduced a voluntary vehicle energy-efficiency labeling program; the labels indicate fuel consumption rates for light-duty vehicles with a spark-ignition engine. Brazil also published a new automotive regime that establishes energy-efficiency targets to be measured from 2016 to 2017. Failure to achieve an absolute target for “corporate energy efficiency” as a function of “fleet corporate average mass” will result in cumulative fines on all light automotive domestic sales (local production and imports) retroactive as of January 2013. Tax reductions are available if further fuel-efficiency improvements are achieved.

A star ranking for light vehicles was also recently introduced, favoring low-emission, ethanol, flexible-fuel and hybrid vehicles. Diesel use in light vehicles under a one-ton payload is not allowed in Brazil, except for combined-usage vehicles with special off-road characteristics.

Other South American countries, such as Argentina and Colombia, have significantly increased the use of biofuels. And in 2013, Chile introduced requirements that the fuel-consumption and carbon dioxide emissions levels of light-duty vehicles be posted at sales locations and in owners’ manuals. Chile also introduced a tax based on urban fuel consumption and nitrogen oxide emissions for light and medium vehicles beginning in late 2014.

### READ MORE:

*We have a comprehensive, science based strategy for doing our part to reduce climate change*

> [Ford’s Climate Change Strategy](#)

*We are making progress on our vehicle CO<sub>2</sub> reduction goals in all of our regions*

> [Vehicle Fuel Efficiency and CO<sub>2</sub> Emissions Progress and Performance](#)

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# Middle East and Africa Policy

The Middle East and Africa (MEA) region is composed of a diverse range of markets with different political, cultural and economic environments. For example, the region includes some of the wealthiest countries in the world per capita as well as some of the poorest; it also includes both significant oil importers and significant oil exporters.

Up to now, fuel economy and carbon dioxide (CO<sub>2</sub>) emissions have not been key political or consumer priorities in many of these markets, although the products we have sold in the region have generally benefited from fuel economy and CO<sub>2</sub> improvements we have implemented for products in other regions. We anticipate that new regulatory challenges and opportunities are likely to emerge in the near future.

South Africa has been in the lead in developing standards to reduce vehicle CO<sub>2</sub> emissions. Since 2010, they have enforced a tax based on vehicles' CO<sub>2</sub> emission levels.

Saudi Arabia has more recently been focusing on fuel-efficiency improvements in their vehicle fleet. In 2014, the Saudi Arabian government announced that, beginning in 2016, they will introduce fuel economy regulations similar to the U.S. Corporate Average Fuel Economy requirements. Also in 2014, Saudi Arabia introduced vehicle fuel economy labeling requirements, which are likely to be extended to other Gulf States in 2016. We continue to maintain dialogue with the government of Saudi Arabia, and those in our other MEA markets, to ensure that our product strategies complement and align with their national goals.

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# Renewable Fuels Policy

Today, more than 80 percent of global oil reserves are limited to 10 countries, while biofuels made from sugarcane can be produced in more than 100 countries. First-generation biofuels are playing an important role in building consumer awareness and spurring capital investment in infrastructure and facilities that can be used for more promising second-generation biofuels.

In the U.S., Ford is among the leaders in providing vehicles that can operate on biofuels, and we will continue to produce vehicles capable of operating on biofuels in line with consumer demand and retail refueling infrastructure development. Our flexible-fuel vehicles (FFVs), which we are delivering at no additional cost to consumers, go well beyond requirements and what most other automakers are doing.

Ford’s vision for sustainable biofuels is for accelerated use of renewable fuels to improve energy security, enhance economic development and help to address climate change. This vision includes rapidly expanding the number of vehicles that can operate on biofuels in some regions, increasing the number of stations offering biofuels, developing the fuel distribution network to support convenient customer accessibility and value, and achieving technology breakthroughs to commercialize advanced biofuels production.

Policies in several regions are aimed at increasing the use and availability of biofuels. The U.S. adopted a Renewable Fuel Standard (RFS) requiring 36 billion gallons of biofuels by 2022. This law also requires that, beginning in 2010, a certain portion of these biofuels must be “advanced” and/or cellulosic-based fuels. Full deployment of E10 (a blend of 10 percent bioethanol and 90 percent traditional gasoline) for gasoline-powered vehicles would achieve approximately one-third of the RFS-mandated biofuel use by 2022. Therefore, meeting the full RFS biofuel requirement will require much greater use of E85 in FFVs and/or the development of vehicles that can use “mid-level blends” of ethanol and gasoline. The expanded use of E85 in FFVs would require a commensurate increase in E85 fueling infrastructure. An approach using mid-level ethanol blends would require that all new vehicles be designed for higher ethanol capability, and the existing fueling infrastructure would need to be updated for compatibility with fuel containing higher concentrations of ethanol.

In Europe, the EU Renewable Energy Directive has established a 10 percent renewable energy target for transportation energy in 2020, including the use of renewable-based electricity. The EU is also adding more-specific criteria regarding the types of sustainable biofuels that can be counted toward this regulation, and is aiming to limit the amount of crop-based biofuels used to meet the standard. Brazil has had a very aggressive domestic ethanol program for years.

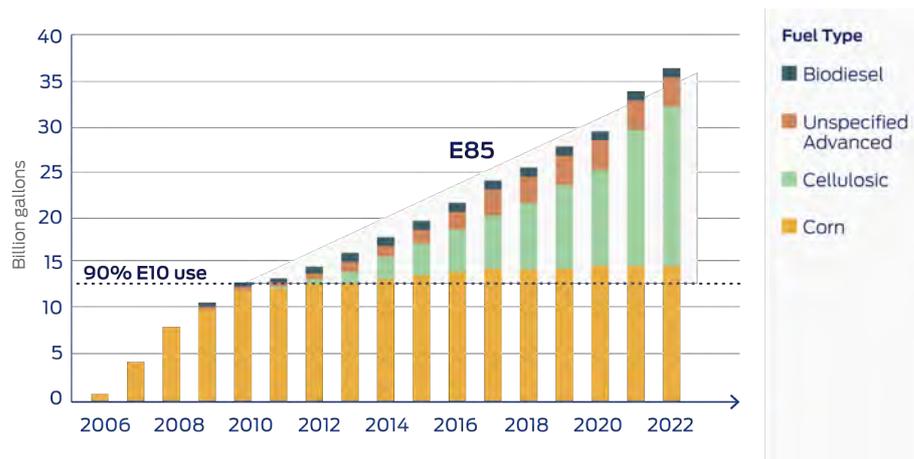
But these policies aren’t enough. Providing value and refueling accessibility is critical to engage consumers and get them to use alternative energy sources. Hundreds of millions of

vehicles in operation today were designed to use ethanol blends containing less than 10 percent ethanol, and our transportation energy infrastructure was set up to deliver petroleum-based fuels rather than high-concentration alcohols.

In January 2011, the U.S. Environmental Protection Agency (EPA) approved a waiver allowing the use of E15 (a blend of 85 percent gasoline and 15 percent ethanol) in 2001 and later model year vehicles. However E15 may not be compatible with many older gasoline-powered vehicles on the road today.

In Europe, we recommend that biofuel use be harmonized throughout the region by targeting the introduction of B7 and E10 as standard fuels.

## U.S. Renewable Fuel Standard



### READ MORE:

*Ford has a long history of developing vehicles that run on renewable biofuels*

[> Renewable Biofueled Vehicles](#)

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# Electrification

As advanced technology vehicles – such as hybrids, plug-in hybrids and all-electric vehicles – increase in numbers on our highways and roads, manufacturers must work together, and with governments as appropriate, to set standards for certain technical aspects of these new vehicles, to enable the market to grow smoothly.

Consider, for example, when we go to a gas station, we take for granted that the pump nozzle is a size that will work with our vehicle. Early on, a standard size and configuration had to be developed and agreed to across all automobile and gasoline pump manufacturers, so that drivers could have a hassle-free experience when they went to fill up. As demand for and availability of plug-in electric vehicles continues to rise, it is similarly important that consistent standards be put in place regarding the technical aspects of these vehicles.

In North America, the Society of Automotive Engineers (SAE), with the participation of Ford and other automotive companies, successfully developed and published a standard charge connector and communication protocol that enables all plug-in vehicles to use common charge points. This gives public charging station manufacturers and vehicle manufacturers the ability to design products that work with each other. For Ford, it enables our plug-in vehicles to charge a fully depleted battery in 2.5 to 3.5 hours using many station manufactured by different companies. The same approach is being used in Europe and China. For faster charging, the SAE (again with Ford's participation) also approved a standard plug and interface to enable vehicles to charge their battery in as short as 20 minutes using a common port. In Europe, the standards organizations adopted this same "fast-charge" framework, called the DC Combined Charging System. In addition, Ford participates in standards work to harmonize wireless charging globally.

Ford is also working with other OEMs and suppliers to ensure that charge point locations can be displayed within vehicles' navigation systems or vehicle apps, and for common access to all public charging stations. And, we and the industry are working collaboratively with the Obama administration and the U.S. Congress to address the challenges associated with the deployment and use of electric-drive vehicles and infrastructure. In January 2013 we signed onto the U.S. Department of Energy's pledge to increase vehicle charging infrastructure available in workplaces across the country. As part of this program, we are installing 200 electric vehicle charging stations at Ford facilities in the U.S. and Canada. To date, we have installed over 150 stations at over 40 locations.

We have also taken a standards approach in the recommendation of the Ford-branded charge stations from AeroVironment. These charge stations not only meet the standards referenced above, but work with all of our plug-in products (i.e., plug-in electric vehicles and battery electric vehicles) and can be used in indoor, outdoor, residential and commercial settings throughout U.S. and Canada. In Europe, a similar relationship has been established with Schneider Electric consistent with our European deployment of

electrified vehicles.

**READ MORE:**

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*We have a comprehensive, science based strategy for doing our part to reduce climate change*

> [Ford's Climate Change Strategy](#)

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*We are implementing a suite of fuel efficiency technologies as well as alternative fuel and powertrain vehicles*

> [Sustainable Technologies and Alternative Fuels Plan](#)

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# Non-CO<sub>2</sub> Tailpipe Emissions

## U.S. Policy

In the U.S., the Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) regulate smog-forming tailpipe emissions, including hydrocarbons, nitrogen oxides, carbon monoxide and particulate matter.

In 2014, the EPA adopted new Tier 3 standards, which are more stringent motor-vehicle emissions standards for future model years.

As part of these new standards, the EPA is also requiring the reduction of sulfur levels in gasoline, which will improve the performance of existing catalyst technology in gasoline vehicles and result in reductions in nitrogen oxide, carbon monoxide and volatile organic compound emissions from vehicles.

The EPA also has stringent emissions standards and requirements for EPA-defined “heavy-duty” vehicles and engines (generally, those vehicles with a gross vehicle weight rating of 8,500 pounds to 14,000 pounds). These regulations are relevant to Ford’s Super Duty® trucks and some commercial vans. In order to meet the standards for heavy-duty diesel trucks, Ford and most other manufacturers use selective catalytic reduction (SCR) systems, which require periodic customer maintenance. The EPA has issued guidance calling for stringent warning systems and driver inducements to alert motorists to the need for the maintenance of SCR systems.

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

- Meet California’s Super Ultra Low Emission Vehicle (SULEV) exhaust emissions standard
- Produce zero fuel-system evaporative emissions
- Be emissions-compliant for a full useful life of 150,000 miles

In 2012, CARB finalized revisions to its LEV and ZEV regulations. The new LEV-III Program begins to take effect with the 2015 model year and includes more stringent tailpipe and evaporative emissions standards for light- and medium-duty vehicles, extended durability requirements and changes to the certification test procedures, which will require manufacturers to certify vehicles on fuel containing 10 percent ethanol. The amended ZEV regulations mandate substantial annual increases in the production and sale of battery-electric, fuel-cell and plug-in hybrid vehicles for the 2018–2025 model years. By the 2025 model year, approximately 15 percent of a manufacturer’s total California sales volume will need to be made up of such vehicles. The LEV-III regulations will also require automobile manufacturers to design and develop new emissions after-treatment systems.

Compliance with the 2018–2025 ZEV mandate involves intensive planning efforts and large

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capital investments in order to deliver the required number of advanced-technology vehicles. We are concerned that the market and infrastructure in California might not support the large volumes of advanced-technology vehicles that manufacturers will be required to produce, particularly in the 2018–2025 model years. We also are concerned about potential enforcement of the ZEV mandate in other states that have adopted California’s ZEV program, where the existence of a market for such vehicles is even less certain. We are working with CARB through their regulatory processes to help develop rules that are both effective and feasible. In setting tailpipe emissions regulations, other rules that apply to vehicles – such as fuel economy/greenhouse gas standards and safety standards – must be taken into account to ensure that the total package of requirements is workable.

Ford continues to oppose technology mandates that seek to impose quotas or limits on the production or sale of vehicles with specified powertrain technologies. Regulatory efforts to dictate market outcomes, or to pick technology “winners” and “losers,” have never produced successful outcomes. Manufacturers need the flexibility to build the kinds of vehicles that the marketplace demands based on consumer preferences and other external factors. Emissions standards should be performance-based and should be designed to enable manufacturers to introduce vehicles with an array of different, affordable technologies.

## European Policy

All of our new passenger cars registered as of January 1, 2011, and all light-duty vehicles registered as of January 1, 2012, comply with the Euro 5 emissions standards. Euro 6 standards have since been developed. The initial phase of Euro 6 began in September 2014. The second phase of Euro 6 standards, which will be even more stringent, will be applied beginning in 2017. New test procedures based on consumer driving patterns have also been developed by the European Commission for use during the implementation of the Euro 6 standards. These new emissions-testing requirements are focused primarily on delivering reduced tailpipe nitrogen oxide (NO<sub>x</sub>) emissions. The European Commission is also developing rules for increasing the severity of the low-temperature testing and evaporative emissions requirements again. We are actively engaged with the European Commission and the European member states in developing better regulations.

## Asia Pacific Policy

Since 2010, our new gasoline-fueled passenger vehicles have been designed to comply with China Stage IV requirements (based on Euro 4 standards). China began implementing the more recent European standards (Euro 5) in Beijing in 2013. Korea and Taiwan have adopted very stringent U.S.-based standards for gasoline vehicles and European-based standards for diesel vehicles. Japan, which has unique standards and test procedures, began implementing more stringent standards in 2009. Ford is working to comply with all of these standards using a variety of approaches, including on-board diagnostics and after-treatment technologies.

## South America Policy

New passenger and commercial vehicles in South America must comply with varying levels of U.S.- or European-based emissions regulations. Recently, Brazil, Argentina and Chile have introduced more stringent emissions standards. Brazil requires L6 emission phase and on-board diagnostics for all light-duty vehicles starting in 2015; more stringent on-board diagnostic for diesel light vehicles will be mandatory in 2017. Brazil’s P7 standards, based on Euro 5 emissions and on-board diagnostic standards for heavy vehicles started in 2012.

Argentina began requiring Euro 5 standards in 2015 for new light vehicle homologations,

and will require it in 2017 for new light vehicle registrations. Heavy-duty vehicles will be required to meet Euro 5 standards in 2016 for new vehicle homologations and in 2018 for new vehicle registrations.

In 2014, Chile introduced Euro 5 standards, or U.S. based standards as an alternative, for all light vehicles. Heavy-duty vehicles are required to meet Euro 5 (or corresponding U.S. emissions standards) for new vehicle homologations as of October 2014; these will be required in October 2015 for new vehicle registrations.

As a consequence, the following non-CO<sub>2</sub> emissions-control technologies have been or will be introduced on our vehicles sold in South America: on-board diagnostic systems in Brazil and Argentina (which are being studied for use in Chile); particulate filter technology for some diesel products; and selective catalytic-reduction systems for heavy diesels in all three countries.

## Middle East and Africa Policy

New passenger and commercial vehicles in the Middle East (Gulf States) must comply with Euro 2 standards, although plans are under development for more stringent emission standards (Euro 4) in or around 2017.

Across Africa, emission standards range from none to Euro 5 and are generally limited by the poor fuel quality seen across the continent.

### READ MORE:

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*With increasing numbers of vehicles on the road, we are working hard to address air quality with more fuel-efficient and alternative powertrains*

> [Non-CO<sub>2</sub> Tailpipe Emissions](#)

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# Undesirable Chemicals

The European Union’s REACH program (Registration, Evaluation, Authorization and restriction of CHemical substances) regulates and seeks to phase out chemicals of concern. More and more countries outside of the EU have adopted similar regulations, including Turkey, Romania, China, Japan, Taiwan, South Korea and Canada.

In the U.S., the Senate and House have both proposed bills since 2010 to overhaul the Toxic Substances Control Act, which was first enacted in 1976, but to date none have passed. The state of California passed a “safer consumer products” law (the Green Chemistry Initiative), which took effect in late 2013, which will require manufacturers of selected products (so called “priority products”) sold in California to identify safer alternatives to a potential range of 1,200 chemicals known to be harmful to public health and the environment. The California law will also phase in a requirement that manufacturers whose priority products contain listed chemicals of concern must conduct an “alternative assessment” and replace the chemicals of concern with safer alternatives, or explain to state regulators why the chemicals of concern are needed and warn consumers or undertake steps to mitigate the public’s exposure to those substances. The California law, with its requirements of alternative assessments, goes beyond REACH-like statutes, which mandate simply removing or phasing out substances of concern.

In January 2009, the United Nations implemented regulations requiring a globally harmonized system (GHS) of classification and labeling of chemicals. In the U.S., implementation of the GHS requirements starts with employee training, which had to be completed by the end of 2013. By June 1, 2016, employers must be in full compliance with the revised Hazard Communication Standard (HCS), including complete training of employees on new hazards and/or revisions to workplace hazard communication programs.

We believe that regulatory requirements for the phase-out of undesirable chemicals need to be prioritized and implemented in a workable manner. Government and industry resource constraints mean that not all chemicals of concern can be addressed at once. Moreover, manufacturers and suppliers need adequate lead-time to identify replacement substances that are more environmentally friendly than the ones they replace, and also to design and engineer components that incorporate these new substances. Ford will continue to work with regulatory agencies to help develop rules that target the highest-priority chemicals first, and that drive steady progress toward the elimination of chemicals of concern in an effective and efficient manner.

### READ MORE:

*We consider the impacts of materials at every stage of a vehicle’s life cycle*

> [Sustainable Materials](#)

> [Sustainable Materials Management](#)



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# Manufacturing

Manufacturing is a critical driver of economic growth, providing jobs and tax revenue, creating new products and technologies, and promoting overall prosperity. About 70 percent of all the research and development investment in the U.S. comes from the manufacturing sector. Ford alone spends \$5 billion on research and development annually. We believe that a strong manufacturing base – with its attendant focus on engineering, science and technology innovations – is important not only for national prosperity but for energy independence, energy security and sustainability.

A variety of policy areas impact the success of U.S. manufacturing, and it is important that Ford informs U.S. policy-makers, in order to shape a climate for economic growth, regulatory certainty and a strong foundation for U.S. exports. Integrated elements of a competitive U.S. manufacturing agenda include the following:

- **Corporate tax reform:** The U.S. has the highest corporate tax rate among developed countries. A lower rate would allow U.S.-headquartered companies to compete on a level playing field and free up capital that can be reinvested in new products, technologies and manufacturing innovation.
- **Regulatory efficiency and certainty:** Ford’s continued investment in the U.S. is enhanced by a stable and predictable regulatory environment for safety, fuel economy and greenhouse gas emissions that balance our shared policy goals, economic realities and consumer acceptance. A performance-based, data-driven approach to regulation is critical as we develop emerging technologies such as vehicle-to-vehicle communications and driver assist features. We need efficiency in the regulatory process that provides certainty and avoids a patchwork of state regulations that can undermine efficiency – often with no societal or environmental benefit. When multiple regulators exist, we need to work together to ensure that we ultimately develop standards that are achievable and consistent with one another so that compliance costs are minimized.
- **Trade:** Ford has supported every free trade agreement approved by the U.S., and Ford is a leading vehicle exporter from the U.S. We support strong free trade that increases market access and eliminates trade barriers. Currency manipulation – highlighted by many academics and economists as the most significant trade barrier of the 21st century – must be addressed as part of free trade agreements with nations that have a history of currency intervention. The guiding principle for effective trade must be that markets set exchange rates, not governments. In addition, trade agreements also can help shape and harmonize regulations. A U.S.-EU trade agreement that pursues regulatory harmonization and mutual recognition of standards would enhance both regions’ competitiveness in today’s global marketplace.

- **Training and education:** We need to continue training our workforce and encourage education in math, science and engineering if the U.S. is to remain competitive and innovative. In our hourly workforce, continued “up-skilling” is critical to maintaining our competitive performance. Existing federal training programs should be flexible, work closely with states and prioritize incumbent worker training.

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# Vehicle Safety

At Ford, safety is a central mission that informs and guides our every design and engineering effort. We are committed to continuous improvement in vehicle safety and to driver education and efforts to promote safer roadways. Even as technology continues to advance, safety belts still remain the most important vehicle safety technology available. We work with governments and the public to continue to further reduce traffic-related injuries and fatalities.

In the U.S., the National Traffic and Motor Vehicle Safety Act of 1966 (the “Safety Act”) regulates vehicles and vehicle equipment in two primary ways. First, the Safety Act prohibits the sale in the United States of any new vehicle or equipment that does not conform to applicable vehicle safety standards established by the National Highway Traffic Safety Administration (NHTSA). Second, the Safety Act requires that defects related to motor vehicle safety be remedied through safety recall campaigns. Manufacturers are obligated to recall vehicles if they determine the vehicles do not comply with a safety standard or contain a defect affecting safety. Canada typically closely follows the United States’ regulations.

The EU and many countries around the world have established vehicle safety standards and regulations and are likely to adopt additional or more stringent requirements in the future. The European General Safety Regulation introduced United Nations Economic Commission for Europe (UN-ECE) regulations. The EU, Russia, Japan and many countries worldwide have adopted these UN-ECE regulations, in full or modified. Globally, several countries – including those in the EU and Gulf Cooperation Council, as well as China and India – have or are considering defect- and recall-related requirements. Although many countries are trending towards UN-ECE based regulations, the global landscape remains very complex. Ford continues to promote and support global regulatory harmonization activities.

At Ford, we recognize that driver distraction is an important safety issue. That is why we pioneered the use of hands-free, voice-activated technology to help drivers keep their hands on the wheel and eyes on the road. It is also why Ford was the first automaker to support a national ban on the use of hand-held devices while driving. We also support Graduated Driver Licensing (GDL) programs that restrict cell phone use and text messaging by new drivers, as discussed below.

We strongly support GDL programs in the U.S. as a means of helping to reduce crashes, injuries and fatalities involving novice teen drivers. The most effective GDL programs require a minimum learner permit age of 16, an intermediate license until age 17, and at least 65 hours of supervised training, in addition to prohibiting night-time driving after 8 pm and banning all teenage passengers for intermediate drivers. All U.S. states have adopted some level of GDL requirements, though not all states have chosen to adopt all GDL elements. Ford encourages every state and the District of Columbia to adopt strong

GDL programs, including information on safety belt use and the dangers of impaired and distracted driving.

**READ MORE:**

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*We are implementing innovative technologies to enhance the safety and performance of our vehicles*

[> Vehicle Safety](#)

[> Vehicle Safety and Accident Avoidance](#)

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[Home](#) > [Strategy and Governance](#) > [Public Policy](#) > [Public Policy Positions](#) > **[Vehicle Safety](#)**



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# Human Rights

Ford is committed to respecting human rights everywhere we operate, because it is the right thing to do and it strengthens our business in the long run. We believe we are a leader in addressing human rights and working conditions in the auto industry. As discussed on the [Policy Letters and Directives](#) page, our commitment to human rights is embodied in our Policy Letter 24: Code of Human Rights, Basic Working Conditions, and Corporate Responsibility.

In 2008, we joined the United Nations Global Compact, a framework for businesses committed to aligning their operations and strategies with 10 universally accepted principles in the areas of human rights, labor, the environment and anti-corruption.

For several years, we worked with leaders of the U.S. Department of State's human rights programs and the U.S. Department of Labor to explore how to encourage multinational companies to act as a positive force in protecting human rights in global trade, both through work in their own supply chains and through advocacy. We also consulted with these agencies on how the U.S. government can encourage the protection of human rights through its purchasing practices. In January 2015, the U.S. federal government implemented a final Federal Acquisition Regulation, which strengthens protections against human trafficking in government contracts. We were the only automaker in attendance at the White House's unveiling of this final rule. Several states have also passed local legislation to prevent human trafficking.

Ford supports the underlying goals of human rights legislation, and where appropriate, we are participating in sector-specific initiatives and with international organizations to systematically evaluate supply chains to determine the most effective measures to combat human rights violations.

### READ MORE:

Ford's commitment to human rights is embodied in Policy Letter 24, our Code of Human Rights, Basic Working Conditions and Corporate Responsibility

> [Policy Letters and Directives](#)

We are working with our suppliers on human rights and working conditions

> [Human Rights and Working Conditions in Our Supply Chain](#)

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# International Trade

As a global automaker, Ford has a strong interest in issues relating to international trade. With manufacturing facilities in the Americas, Europe, Asia Pacific, and Africa, sales in all key global markets and a global supply chain that moves parts worldwide, we are a strong supporter of trade liberalization. Free trade is foundational to our business model.

To further increase automotive exports and support automotive jobs, we believe a new approach to trade is required that puts manufacturing at the forefront. Given the importance of manufacturing to the U.S. economy, Ford supports a manufacturing-driven trade strategy that:

- Drives innovation and delivers economic opportunity to its citizenry by maintaining a vibrant manufacturing sector as its cornerstone
- Enables manufacturing in our major countries of operation to compete on a level playing field against the best competition from around the globe

Also, we believe 21st century trade deals should work to remove 21st century trade barriers. The elimination of trade-distorting policies such as currency intervention and manipulation must be included in any trade initiative. Currency manipulation provides foreign automakers with an export subsidy of several thousand dollars per vehicle, while at the same time acting as the ultimate nontariff barrier, protecting their market from imports. Ford believes the market should set currency exchange rates – not governments.

A good example of this is the discussion around the Trans-Atlantic Trade and Investment Partnership (TTIP). Ford believes that an ambitious TTIP that allows for the mutual recognition of regulations would represent a significant step forward – reducing costs, providing greater business predictability and maintaining the EU and U.S. at the forefront of the global auto industry. TTIP would create a free trade zone between the world's two largest trading partners that will benefit both the EU and the U.S., and at the same time could serve as a template for future agreements with other world regions. By removing tariff barriers and mutually recognizing regulations, it will open up markets and increases genuine competition, which could benefit customers on both sides of the Atlantic.

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# Education

Ford understands that global competitiveness depends on the ability of our K–12 educational systems and post-secondary institutions to prepare a 21st century workforce.

With baby boomers beginning to retire in large numbers, and many high-skilled jobs going unfilled, improving the quality and performance of our schools has become an urgent issue facing communities large and small across the country. Within these communities, too many students are disconnected and unsuccessful in schools that struggle to be as engaging and relevant as they need to be. Add to that the considerable anxiety being generated by an economy in transition – from industrial-based to knowledge-based – and education emerges as a critical factor in securing financial health and prosperity for individuals, communities and the nation.

Ford recognizes the importance of these issues and supports public policies and initiatives that are designed to mobilize educators, employers and community leaders to bring communities together to transform the entire educational system. These programs provide students with real-world learning opportunities that help them:

- Develop essential higher-order skills, such as critical thinking, problem solving, communication, innovation and creativity
- Make connections between the academic subjects taught in the classroom and their application in the real world
- Make meaningful connections to higher education
- Build more sustainable communities by involving local business and community organizations to create service-based academic projects that make learning more applicable to real-world situations and positively impact the community

By helping communities address this most critical challenge, Ford continues its long tradition of leading and supporting educational initiatives that empower students, strengthen communities and benefit the economy.

### READ MORE:



*Education is one of our priority areas for community engagement and investment*

> [Community Engagement and Investment](#)

> [Building a Better World: Ford's Community Projects Around the World](#)



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# Water

At Ford, we see water as far more than an environmental concern. Since 2012, we have recognized a basic human right to clean, affordable drinking water and adequate and accessible sanitation and, through our water strategy, we seek to uphold and respect that right. Our water strategy complements our overall human rights policy (Policy Letter 24: Code of Human Rights, Basic Working Conditions and Corporate Responsibility).

We believe that business has a key role to play in finding sustainable solutions to current and future global water challenges, and our comprehensive water strategy aims to reduce the water impacts of our operations. But we recognize that the water issue is a challenge too large for one company to tackle on its own. We must work toward large-scale collaborative action at the local, national and global levels if we want to identify and implement meaningful solutions. We are committed to continuous improvement through research and partnerships with other companies and organizations to develop improved best practices in responsible water stewardship.

We will collaborate with others, both public and private, to address water challenges (including access to water, sanitation and hygiene) while raising issue awareness by:

- Striving to be recognized as an automotive industry leader within the core elements of the United Nations CEO Water Mandate
- Being actively involved in stakeholder platforms and efforts to address water challenges globally in the watersheds where we operate
- Mobilizing positive action on water issues through efforts directed at employees, public and private stakeholders and the supply chain

We also will collaborate with governments where we operate to promote sound water management practices for sustainability by:

- Engaging with basin governance structures, where relevant, in countries and regions where we operate
- Collaborating with government affairs teams to tell our story and engage with governments on the formulation of regulation and the creation of market mechanisms to support water sustainability
- Supporting water sustainability efforts in global and local policy discussions

### READ MORE:

*We recognize a basic human right to clean, affordable drinking water and adequate and accessible sanitation*

> [Water Management](#)

> [Ford's Water Strategy](#)

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# Stakeholder Engagement

We have sustained, interdependent relationships with several distinct categories of stakeholders: employees, customers, dealers, suppliers, investors and communities. Also important is our relationship to “society,” which includes government agencies, nongovernmental organizations (NGOs) and academia.

We identified these categories of stakeholders through internal analysis and discussion during the early phases of developing our sustainability programs. This section describes who our primary stakeholders are and how we engage with them.

## Employees



As of year-end 2014, we employed approximately 187,000 individuals and had 62 plants around the world. (Included in the number of plants are those of our consolidated joint ventures.) Substantially all of the hourly employees in our Automotive operations in the U.S. are represented by unions and covered by collective bargaining agreements. Most hourly employees and many nonmanagement salaried employees of our subsidiaries outside the U.S. are also represented by unions. These unions are key partners with Ford in providing a safe, productive and respectful workplace.

**187,000**  
employees

Ford faces workplace health and safety challenges similar to those of many multinational manufacturing companies. These challenges include, for example, establishing and reinforcing high, common expectations for the safety of our employees worldwide. Most of our manufacturing facilities have joint union/management safety committees that guide the development and implementation of safety programs in their operations.

## Investors



Our success as a company directly affects our approximately 138,000 investors,<sup>1</sup> and we have been focused on improving Ford's financial health. We continue to maintain open communication with the investment community. We regularly host conference calls and participate in key automotive conferences during the year. During 2014, John Fleming, Executive Vice President, Global Manufacturing and Labor Affairs, held a special briefing for investors and the media highlighting Ford's global water strategy, discussing details of the 2012/13 Sustainability Report and answering questions. In addition, our [Investor Relations](#) website is a good

**138,000**  
stockholders

source of information for investors. It contains company reports, a schedule of events and investment information.

1. As of February 6, 2015

## Communities



Our company impacts the communities in which we operate in numerous ways, from the employment we provide and the taxes we pay, to the environmental and safety performance of our operations and vehicles, to the ways in which we support and participate in civic life. Responsibly managing these impacts is not just about being a good neighbor; it is fundamental to the success of our business.

62  
plants worldwide

The communities in which we operate are composed of a diverse range of individuals and groups. They include our customers, our employees, our business partners and their employees, government regulators, members of civil society and community organizations, and those individuals who live and work around our facilities, among others. Developing and maintaining positive relationships with these varied groups is an important factor in our reputation and operational efficiency.

Also see:

> [Communities](#)

## Supply Chain



Suppliers are an integral part of our business, and our success is interdependent with theirs. We rely on 1,200 Tier 1 suppliers and more than 11,000 supplier companies total to provide many of the parts that are assembled into Ford vehicles as well as a wide range of nonproduction goods and services, from industrial materials to computers to advertising.

Over  
\$100  
billion  
annual buy

Our supply base is increasingly global. We are expanding production in several regions to serve the sales growth that is expected to occur in emerging markets. We are also expanding our sourcing in these lower-cost emerging markets, as a way to serve both local markets and the global supply chain. These changes, and our efforts to ensure good working conditions in our supply chain, are discussed in detail in the [Supply Chain](#) section of this report.

## Customers



Ford's customers make us who we are. In 2014, we sold more than 6.3 million vehicles to our customers worldwide.

We serve three primary types of customers: individual retail consumers, small business customers and large commercial fleet customers. We will continue to expand our products and

6.3 million  
vehicles sold in 2014

services for these existing customers while working simultaneously to gain new customers in emerging markets.

## Dealers



Our dealers are the face of Ford to our customers and communities. They are key employers and contributors to local economies. Ford and Lincoln dealers in the U.S. alone employed 170,000 individuals at the end of 2014, with an annual payroll of more than \$7 billion. Worldwide, we had 11,980 Ford and Lincoln dealerships at the end of 2014.

11,980  
dealers

### READ MORE:

- > [Our People](#)
- > [Creating a Sustainable Supply Chain](#)
- > [Community Engagement and Investment](#)

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# Engaging with These Stakeholders

Stakeholder engagement takes place in countless formal and informal ways every day across our company, from meetings with local community groups to market research with customers to gatherings of Ford dealers and suppliers.

At the corporate level, we use a variety of mechanisms to engage with stakeholders on sustainability issues to help us better understand the broader societal issues that our company addresses. Some of these mechanisms are informal and ad hoc. In fact, simply picking up the telephone to discuss an issue with any of the numerous sustainability-related organizations or individuals with whom Ford has a relationship is a part of our standard protocol.

Indeed, the very process of engaging with stakeholders on our Sustainability Report has led to expanded and enhanced information in the report in a number of areas, including our positions on key public policy and other issues.

Some of our more formal engagement mechanisms include the following:

- **The creation of forums to gather stakeholder input on our activities, challenges and performance.** We work with stakeholder committees to help shape and provide feedback on our Sustainability Reports. For example, working with a [Ceres Stakeholder Committee](#) is one of the important ways we get input from stakeholders – including environmental groups, engaged shareholder groups and investors – to inform and shape our reporting approach and our materiality analysis. We have also organized meetings with individuals and groups of stakeholders to solicit input on the key sustainability challenges and opportunities facing Ford. These and other engagements have provided valuable feedback on our sustainability strategy.
- **Outreach on emerging and ongoing issues of particular importance to Ford or our stakeholders.** We believe we have taken a thoughtful approach to our stakeholders as we work through challenging issues. Stakeholder input has been critical to the development and testing of our approach to human rights and carbon dioxide reductions, among other issues.
- **Engagement with local stakeholders in the communities in which we operate** as part of our Code of Human Rights, Basic Working Conditions and Corporate Responsibility assessment process. Read more about our community engagement in our [Communities](#) section.
- **Consultation with organizations that have implemented campaigns targeting Ford.** We are not currently being targeted by organizations implementing campaigns. However, in the past we have benefited from the alternative perspectives presented during these consultations.
- **Engagement with rating and ranking organizations in the investment community.** This has provided us with insight into external perspectives on some important issues

and our relative performance in addressing them.

- **Offering new product test-drive opportunities and advanced product reveals** to our employees, who, in turn, communicate about our vehicles to their friends and families. Read more about our employee engagement efforts in the [Our People](#) section.
- **Sharing stakeholder feedback with our highest governance bodies.** Sustainability issues, including relevant feedback from stakeholders, are reported back to executive management or our Board of Directors as needed. This reporting occurs through regular management channels, including Business Plan Reviews, and regular consultations between the executive managers and the board.

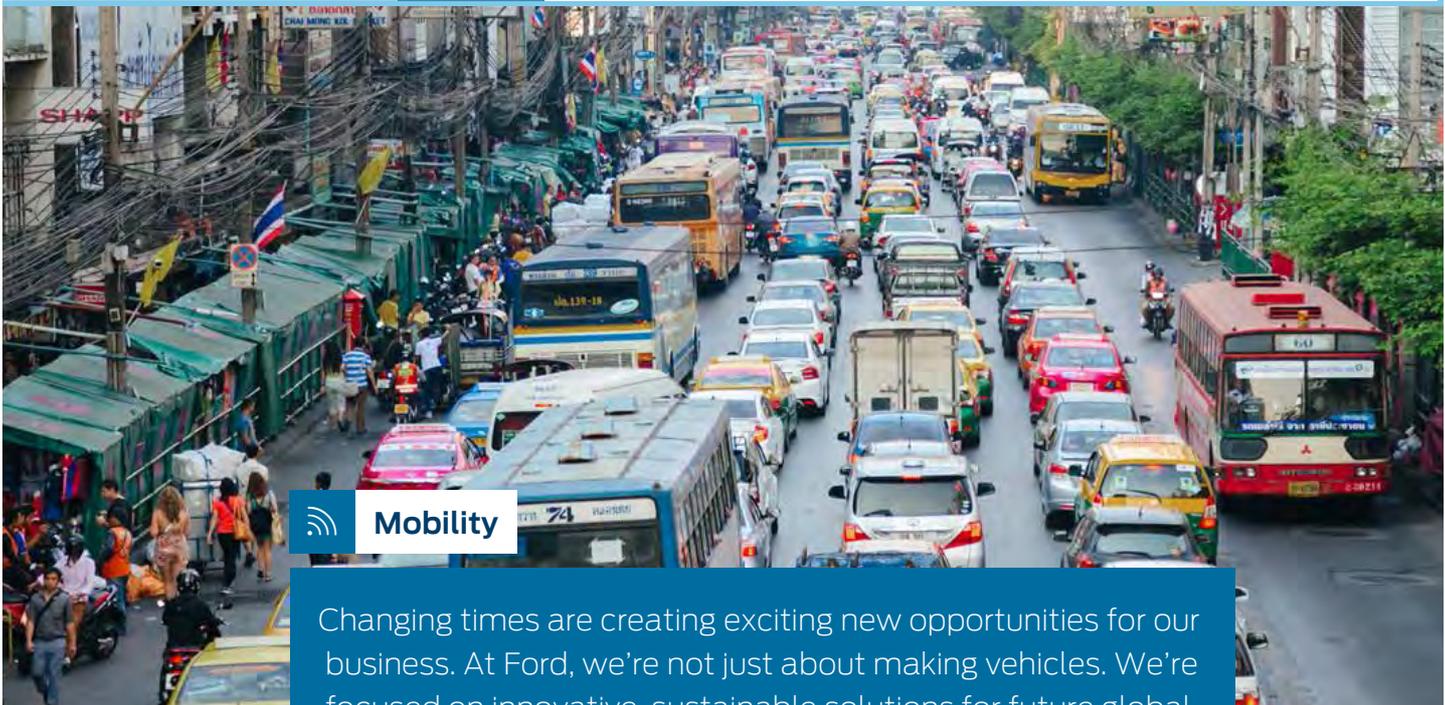
Stakeholder	Communications Forums
<p><b>Communities/Society</b></p> <p>62 plants worldwide*</p> <p>*See our 2014 <a href="#">10-K</a> (pdf, 6.5Mb) for more details</p>	<ul style="list-style-type: none"> <li>• Community Relations Committees</li> <li>• Interactions with governments</li> <li>• Membership in associations</li> <li>• Dialogues with nongovernmental organizations</li> </ul>
<p><b>Investors</b></p> <p>137,803 stockholders*</p> <p>*Common stockholders as of February 6, 2015</p>	<ul style="list-style-type: none"> <li>• Investment community forums</li> <li>• Quarterly earnings communications</li> <li>• Annual shareholders' meeting</li> <li>• Annual report</li> <li>• Proxy statement</li> <li>• SEC filings (e.g., 10-K, 10-Q, 8-K)</li> </ul>
<p><b>Customers</b></p> <p>6.3 million vehicles sold in 2014</p>	<ul style="list-style-type: none"> <li>• Consumer Insight process</li> <li>• Customer care programs</li> <li>• Dealer interactions</li> </ul>
<p><b>Suppliers</b></p> <ul style="list-style-type: none"> <li>• 1,200 Tier 1 suppliers</li> <li>• 11,000+ indirect supplier companies</li> <li>• Over \$100 billion annual buy</li> </ul>	<ul style="list-style-type: none"> <li>• Top supplier meetings</li> <li>• Aligned Business Framework supplier dialogue sessions</li> <li>• Supplier quality roundtables</li> <li>• Supplier Diversity Development Networking</li> <li>• External supplier organizations, such as the Automotive Industry Action Group and the Original Equipment Suppliers Association</li> </ul>
<p><b>Dealers*</b></p> <ul style="list-style-type: none"> <li>• Ford: 10,938</li> <li>• Ford–Lincoln (combined): 869</li> <li>• Lincoln: 173</li> <li>• Total: 11,980</li> </ul> <p>*Worldwide dealerships, as of December 31, 2014</p>	<ul style="list-style-type: none"> <li>• Intranet communications</li> <li>• Brand sales and service representatives</li> <li>• Brand Dealer Councils</li> <li>• Dealer roundtables</li> <li>• President's Circle</li> <li>• Salute to Dealers</li> <li>• Advertising and public service announcements</li> </ul>
<p><b>Employees</b></p> <p>Approximately 187,000 employees*</p> <p>*As of December 31, 2014</p>	<ul style="list-style-type: none"> <li>• Town hall meetings</li> <li>• Labor/management committees</li> <li>• Pulse Survey</li> <li>• Union representation</li> <li>• Intranet surveys and chats</li> <li>• Executive Diversity Council</li> <li>• Local Diversity Councils</li> </ul>

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### Mobility

Changing times are creating exciting new opportunities for our business. At Ford, we're not just about making vehicles. We're focused on innovative, sustainable solutions for future global mobility.

#### Mobility

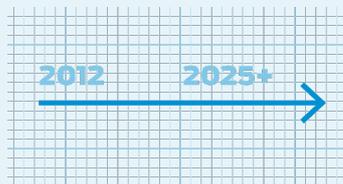
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- Voice: Paul Ballew
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- Spotlight: Improving the Odds in the "Golden Hour"



#### Global Challenges

Five important "megatrends" are guiding our thinking around mobility.

> [Mobility Megatrends](#)



#### Our "Blueprint for Mobility"

We have a multi-decade strategy for helping to create a better world.

> [Defining Mobility](#)



#### The First Step

Across the globe, our mobility experiments are testing new concepts so we can learn which solutions have the most potential.

> [Mobility Solutions](#)

#### GLOBAL CHALLENGES

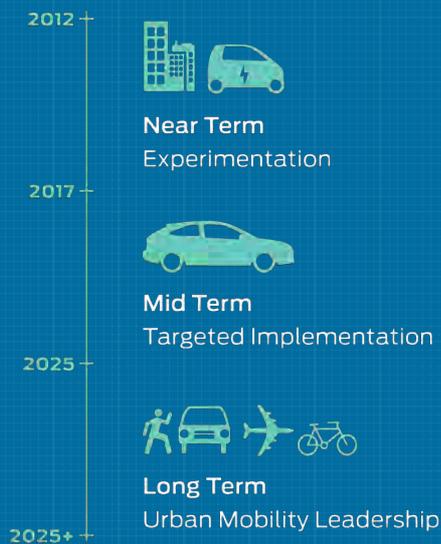
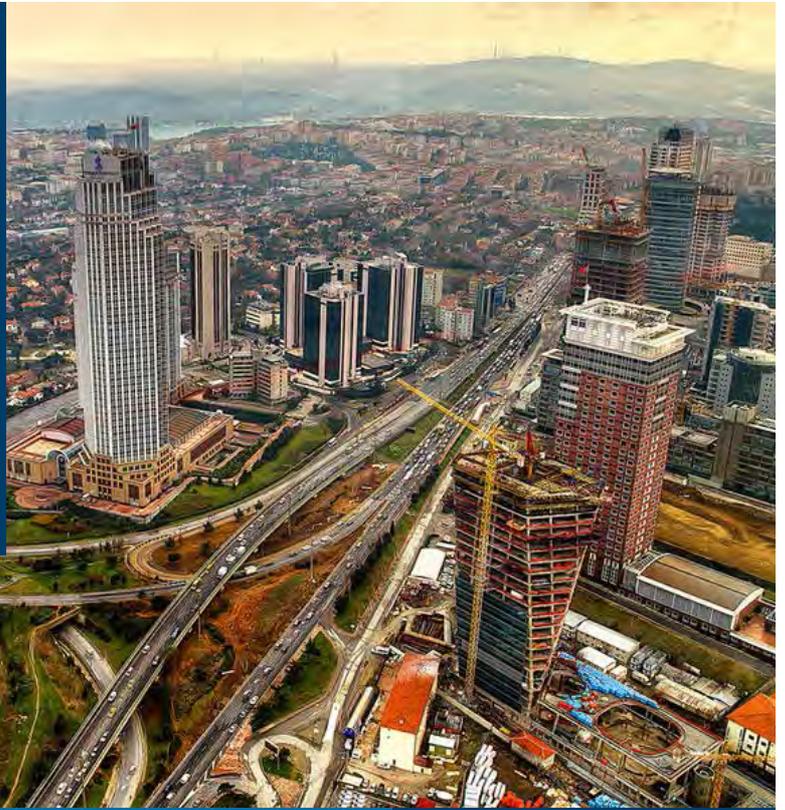
Two-thirds of the world's population will reside in cities by 2030, a growing middle-class will increase vehicle numbers, consumer attitudes are changing and air quality is declining. We will be part



WATCH: "How global megatrends are affecting mobility"

of the solution.

> Mobility Megatrends



OUR "BLUEPRINT FOR MOBILITY"

We see a world where vehicles can communicate and can sense each other's presence and where people routinely share vehicles and use multiple forms of transportation.

> Defining Mobility

THE FIRST STEP

*"We have given our engineers, scientists and technologists a challenge. We have asked them to use innovation not just to create better products. We have asked them to innovate to make the entire transportation experience easier, to make people's lives better, and, in doing so, to create a better world."*



**Mark Fields**  
President and Chief Executive Officer

Our vision has begun with the creation of collaborative mobility experiments across the globe.



> [Mobility Solutions](#)

 [View our initial set of experiments \(pdf, 3.8Mb\)](#)



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## Mobility

### > Defining Mobility

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Connectivity

Autonomous Driving

∨ Gaining Insights from Global Data and Analytics

Focusing on Customers

Case Study: Working Toward Sustainable Mobility in Indore, India

Voice: Ken Washington

Voice: Paul Ballew

Spotlight: Getting a Handle on Mobility

Spotlight: Improving the Odds in the "Golden Hour"

# Defining Mobility

Henry Ford's calling wasn't simply to build a strong business. He was equally passionate about the opportunity to create a better society. He believed that a good business makes excellent products while earning a healthy return. And he proved that a great business can do all that while contributing to a better world.

More than a century later, we are focused on protecting the freedom of movement of people and goods – a freedom that is being affected by large societal [megatrends](#) such as urbanization and increased traffic congestion. To address the risks as well as the opportunities, Ford and society as a whole must change the way we think, collaborate and behave.

*“As we drive innovation in every part of our business, we are determined to learn, to take risks, to challenge custom and question tradition and to change our business going forward. We have given our engineers, scientists and technologists a challenge. We have asked them to use innovation not to just create better products. We have asked them to innovate to make the entire transportation experience easier, to make people’s lives better and, in doing so, to create a better world.”*



**Mark Fields**  
Ford Motor Company President and Chief Executive Officer

We are continuing to drive innovation through every part of our company, whether through engines that save gas, advanced lightweight materials that boost capability, or cutting-edge technologies that improve safety. We go further by viewing ourselves not just as an auto company, but also as a mobility company. Ultimately, we want to help change the way the world moves by tackling critical mobility challenges, whether in crowded cities or remote rural communities.

## Our Vision

Our vision is to truly change how the world moves – again. Henry Ford did that a century ago when he manufactured affordable automobiles for the masses, thereby democratizing travel. We believe we have an opportunity to revolutionize transportation once again, only this time we'll be powered by the digital economy.

We have developed what we call our Blueprint for Mobility, which is our multi-decade strategy for helping to create a better world. We have a range of experiments today that we believe will lead to all-new

*“Growing up, there was something almost heroic*

models of transportation and mobility within the next 10 years and beyond. We envision a future in which vehicles can communicate with one another to warn of traffic or infrastructure delays so the driver can take another route, saving time and reducing congestion; where vehicles sense each other's presence, helping to avert accidents and improve safety; and where people routinely share vehicles and use multiple forms of transportation, enabled through more and better information.

Of course, Ford still is a car and truck company – and we'll continue to improve our vehicles to make them better than ever. But we are evolving our thinking, adjusting our view of the car as an individual object to the car as part of a broader transportation network, all while engaging with customers, governments, citizen groups and other stakeholders to broaden our viewpoints. By driving toward unfettered access to mobility, we can enable human progress.

## Our Response

As part of our response to the risks and opportunities posed by societal trends, we recently announced Ford Smart Mobility, which is our plan to use innovation to take Ford to the next level in connectivity, mobility, autonomous vehicles and big data so we can provide more benefits to customers. Think of the Blueprint for Mobility as our strategic framework. Then think of Ford Smart Mobility as the way we combine key initiatives to deliver on our vision for meeting mobility needs. As the first step, in 2014 we kicked off [25 mobility experiments](#) around the globe – all designed to test new mobility concepts and evaluate their impact on the environment and society, while creating value for our business at the same time.

Ford Smart Mobility will be transformational for our company as we tie together the promise of connected and autonomous vehicles with a broader transportation network that can make traveling from Point A to Point B easier than ever, whether in crowded cities or rural landscapes. We're developing advanced new vehicles and new mobility solutions that, when coupled with other modes of transportation, will change the way the world moves by solving today's growing transit challenges. It may not happen tomorrow – but we're confident that the future possibilities are both very real and incredibly exciting.

By developing new models of mobility, we can also simultaneously help to tackle other major challenges, such as cutting greenhouse gas emissions to combat climate change and reducing the impacts of road construction on lands and communities. The same dedication we have applied to reducing water use and energy consumption at our own facilities will be applied to advancing new models of mobility. We want to serve the mobility needs of increasing numbers of people while paying close attention to related resource use and impacts.

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*about the car. The automobile represented possibility. I think we are there again."*



Bill Ford

Ford Motor Company Executive Chairman



[Read the most up-to-date information on our mobility projects](#)

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# Mobility Megatrends

At Ford, we spend a lot of time looking at market and consumer trends. We need to know where to make our investments today so we can position our company for tomorrow. We must keep one foot in the present to manage our business now while putting one foot in the future to visualize our business down the road.

In particular, five important "megatrends" are guiding our thinking around mobility and have changed the way we view innovation at Ford. These megatrends pose serious threats to the future of society, from urban overcrowding and worsening traffic to air pollution, climate change and resource constraints. But they pose opportunities as well. That's why we used the megatrends as the basis for our [mobility work](#) – to help us find ways to prepare for the mobility needs of today and tomorrow. At least one of these megatrends frames each of our current mobility experiments.

## 1. Urbanization, growing populations in urban environments, and congestion

Today there are 28 megacities – that is, metropolitan areas with total populations of more than 10 million people. By 2030, we expect to see at least 41 megacities worldwide. Further, substantial growth in the number of cities with populations between 1 million and 10 million is predicted. The existing infrastructure for motor vehicles simply cannot sustain the sheer number of vehicles expected to be on the road in the coming years across all urban scales.

## 2. The rapid growth of the global middle class

At the same time as many cities are growing, we are also witnessing the rapid growth of the global middle class. The Brookings Institute reports that the global middle class will double in size by 2030, from 2 billion to 4 billion, with Asia driving much of the growth. Many in this growing middle class will aspire to own a car – one of the traditional markers of economic progress for the last half century. And that brings a new set of challenges.

## 3. Issues of air quality and related health risks from congestion

The World Health Organization is one of many noting that urban air pollution is a serious social and public health issue. Substantial progress has been made in reducing vehicle emissions of nitrogen oxides, volatile organic compounds and particulate matter, and air quality has improved in many cities in developed nations. However, severe challenges exist in developing nations, and meeting air quality standards remains a challenge in many cities in developed nations. Further progress in reducing vehicle emissions is expected as vehicles with modern emission-control systems enter the on-road fleet and as vehicle emission-control technologies continue to

become more effective. Our mobility experiments test ways we can build upon our already-strong commitment to reducing emissions.

#### 4. **Changing consumer attitudes and priorities**

Millennials – those born between the early 1980s and early 2000s – are putting off marriage, delaying home buying and postponing having children. As consumers, they behave differently from older generations, especially when it comes to mobility. In the U.S., for instance, 47 percent of people today like using their smartphones to plan their transportation; 39 percent say they travel by bus, train or taxi so they can multitask; and 34 percent say they would be interested in renting their car to strangers if they could.

#### 5. **Climate change and resource constraints**

As both the developed and developing world continue to grow, innovation and ingenuity will be needed to address impacts from energy use, water use and the increasing demand for raw materials. Transforming mobility through efficient vehicles, low-carbon-dioxide (CO<sub>2</sub>) fuels and multi-modal transportation systems will play an important role in decoupling mobility from resource use, cutting CO<sub>2</sub> emissions related to climate change, improving supply chain sustainability and increasing access to mobility.

(Note that these mobility megatrends, which have some overlap with the [sustainability megatrends](#) we identified as part of our materiality analysis, are focused specifically on drivers of mobility challenges and threats to our business.)

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# Why Mobility Innovation?

As much as we love our cars and trucks, we believe that the auto industry needs to rethink our collective approach. We cannot keep making and selling automobiles the way we always have. The current industry model simply will not work in the future, especially in crowded cities.

Today, there are about 7 billion people in the world, and that number is expected to grow to about 9 billion by 2050. More and more of those people will be living more and more closely together. By 2030, a projected 630 million people will live in megacities of 10 million residents or more.

When we look at population growth in terms of vehicles, the problem becomes even more pronounced. Today, there are about 1 billion vehicles on the road worldwide. But with more people and greater global prosperity, that number is expected to more than double by 2050. This will create congestion and gridlock as never before seen. Already, gridlock plagues many cities, from Los Angeles to London, Istanbul to Jakarta. In the Chinese capital city of Beijing, for example, the average driver has a five-hour daily commute. This issue impacts cities of all sizes.

And although we are developing ever-cleaner cars, a traffic jam with no emissions still is a traffic jam – with concerns that go far beyond inconvenience. The bigger issue is how global gridlock will stifle economic growth, limiting our ability to conduct commerce and keep economies moving. It will only get more difficult to deliver food and needed services, especially to people living in crowded city centers.

We're working on building smart cars that will improve the driving experience and help guide drivers to their destinations. But we, as a society, also need to build smart roads, smart parking, smart public transportation systems – and we need to connect them all using wireless telecommunications. To keep traffic moving, we need an integrated transportation network that uses real-time data to optimize personal mobility on a massive scale.

We're working on these issues not just because we believe it's important for the planet's environmental, social and economic health. (Read the [Climate Change and Environment](#) section for information on how we're tackling climate change by reducing greenhouse gas emissions.) We're also pressing forward because of the business opportunities for our own company. According to some experts, solving these challenges presents a \$130 billion business opportunity for the automotive market. We intend to take part in that opportunity so that Ford Motor Company can be a strong business for the next 100 years.

In other words, we view the disruption that's taking place in mobility as something to embrace – not fear. We want Ford to be part of the solution by redefining what's possible.

We're finding ways to stay relevant today and for the future by enabling people to be mobile with alternative modes of transportation. Ford Motor Company might never

manufacture a bike, but we want to be in a position of enabling consumers to use bikes to get where they want to go – and to think of Ford as part of making the experience better.

Our [global mobility experiments](#) are zeroing in on some of the key challenges and potential solutions to the world's transportation dilemmas. We're looking at areas that may seem unexpected, perhaps even surprising, for an automotive company. We're exploring products and services more holistically, thinking about how vehicles and other modes of transportation will interact with one another and with a city's infrastructure, from trains to pedestrian walkways, buses to bikes.

We're not the only auto company looking at mobility solutions. But we think we're going further than many of our peers by exploring how we can integrate all types of transportation services, in urban as well as in rural environments. We're focusing on partnerships, collaborating with a range of stakeholders, to figure out what might work best in different transportation scenarios. And most of all, we're seeking to make seamless mobility solutions an everyday experience for the many, not just the few.

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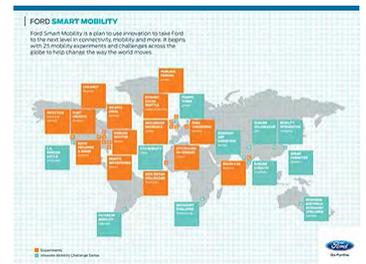
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# Mobility Solutions

Our Ford Smart Mobility Plan, announced at the Consumer Electronics Show in January 2015, will help us address mobility needs. The plan uses innovation to test breakthrough ideas for transporting people, goods and services. The first steps undertaken in 2014 were 25 experiments – eight in North America, nine in Europe and Africa, seven in Asia and one in South America – each of which was designed to anticipate what customers will want and need in tomorrow’s transportation ecosystem.

Fourteen of the initial portfolio of experiments were built around mobility solutions, data insights and technology advancement; the 11 others, also led by Ford, were part of our company’s [Innovate Mobility Challenge Series](#) (see box below), a contest that invites innovators and developers to “crowd-source” solutions for specific mobility challenges in specific parts of the world. We opened up these challenges to the public because we know that Ford can’t solve these problems alone. Solutions must come from a wide variety of individuals, including those who are directly impacted by the challenges we’re working to solve.



 [Ford Smart Mobility Map](#) (pdf, 3.8Mb)

From finding solutions to the woes of parking in dense cities to exploring new models of car sharing, the experiments are designed to help us learn while making mobility more accessible for all, including underserved communities. We know these experiments alone won’t solve the mobility problem, but we believe they are a great place to start.

The experiments focus on customer experiences, flexible usership and social collaboration. Each experiment is unique, with different timelines and learning objectives, all designed to help us make better products and mobility services. We’ve already added initiatives and will continue to modify, expand or close out projects throughout the year as we broaden our understanding of the issues and expand our capabilities.

### Innovative Winners

In early 2015, we announced the latest winners in our Innovate Mobility Challenge series, a key element of Ford Smart Mobility. This program invites software developers and hardware accessory makers to come up with solutions to 11 mobility challenges in cities or regions on six continents. The challenges range from finding better ways to extend healthcare delivery in India and reducing traffic congestion in some of China’s most densely populated cities to improving parking in Los Angeles and taming traffic in London.

Our goal with this series is to bring the global developer community together to create a more sustainable and efficient transportation landscape.

For each challenge, we work with local experts to identify and address the unique mobility needs of that location. Contest submissions are judged by a panel of local experts and Ford executives.

Mobility challenges are, at their very core, local issues.

We awarded prizes exceeding \$200,000 for the winning entries for the 2014 challenges. One grand prize winner, for example, offered a solution to improve mobility during the often crippling four-month monsoon season in Mumbai, India, where heavy rains can make commuting by rail, bus, car, three- and two-wheelers, bicycles and even foot, a time-intensive and potentially dangerous endeavor. The winning submission: The Mumbai Monsoon Helper, which provides real-time weather updates and forecasts, coupled with crowd-sourced information on the severity of flooding, to help commuters make smart decisions about their transportation and help businesses make smart decisions about the delivery of goods and services.

Another grand prize winner – this one for the Parking 2.0 Challenge in Los Angeles – developed a crowd-sourced private and public parking app that aims to improve parking for drivers and lot owners by providing flexible pricing and real-time alerts for near-expired spots.

#### READ MORE:



*Read more about one of the challenge series winners.*

[📄 Spotlight: Improving the Odds in the “Golden Hour”](#)

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# Connectivity

Connectivity. It's the primary enabler for mobility and is essential to so much of 21st century life. We've never seen a time when so many technologies have come together so quickly. Every aspect of our lives is interconnected. It's not just people connected to people, but things connected to things, and people connected to things. All that information can help individuals make better transportation choices and find better ways to get around.

In 2014, there were 4.3 billion smartphones in the world. By 2016, there will be 5.1 billion – a number equivalent to 80 percent of the world's population.

Ford identified the connectivity trend early on with our introduction of Ford SYNC® in 2007. Today, SYNC is the most popular communications and entertainment connectivity system in the industry, with more than 12 million SYNC-equipped vehicles on the road, all over the world. Our latest generation – SYNC 3, which we revealed in December 2014 – is our most advanced version yet.

As we look ahead, we will continue to equip our vehicles with ways to link up to the Internet while experimenting with more ways to connect cars to each other – and to the roadways and networks around them. The systems we use today to bring entertainment into the vehicle and to map our routes are the same systems that will help us create a smart vehicle network.

Connected vehicles could alert each other about traffic jams, accidents, hazards, road works and inexplicable delays. This would allow emergency services to get faster help to people who need it. The potential benefits from vehicle-to-vehicle and vehicle-to-infrastructure connectivity are tremendous as the automobile becomes better integrated into the broader transportation system.

### Research & Innovation Center

In early 2015, we opened our new Research & Innovation Center in Palo Alto, California, to accelerate our pace of innovation, especially in the areas of connectivity, mobility and autonomous vehicles.

The new center joins Ford's global network of research and innovation hubs, including one in Dearborn, Michigan, that focuses on advanced electronics, the human-machine interface, materials science, and big data and analytics. Another Ford center in Aachen, Germany, focuses on next-generation powertrain research, driver assist technologies and active safety systems.

We expect to have one of the largest automotive manufacturer research centers in Silicon Valley by the end of 2015 – with more than 100 researchers, engineers and scientists. Mobility solutions will require fresh ideas and vigorous collaboration between Ford and technology leaders outside the automotive industry. The Palo Alto team will build on existing relationships with universities and technology companies while forging new relationships to create and apply appropriate technologies.

## Electromagnetic Fields

One emerging area of vehicle performance relates to electromagnetic fields, or EMFs. All electronic devices – from household appliances to cellphones to wi-fi routers – put forth low levels of electromagnetic radiation. In vehicles, EMF sources may include components as basic as the battery and alternator and others that are newer such as Bluetooth-enabled applications and passive entry systems. EMF sources may become more numerous in the mobility systems of the future, as vehicles increasingly communicate with each other electronically and with roadway infrastructure.

At present, the U.S. Federal Communications Commission does not regulate EMF levels at the low frequencies (below 100 kHz) found in vehicles. However, voluntary standards have been developed by various independent bodies, notably the International Commission on Non-ionizing Radiation Protection, or ICNIRP.

Ford vehicles are designed to meet the stringent EMF limits for continuous exposure set forth in ICNIRP's 1998 Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic and Electromagnetic Fields. ICNIRP and its partner organizations updated and revised these standards in 2010 based on new research. However, at present Ford continues to follow the earlier guidelines, as we believe they are more protective of individuals with pacemakers – a population of particular concern when it comes to EMFs. Internally, we have also developed an engineering standard that specifies how EMF levels should be tested and measured in our vehicles.

In addition, Ford engineers stay abreast of the latest research on EMFs (some of which we help to fund), and we work with industry partners to help develop industry best practices in this area. For instance, a Ford representative participates on a committee of the International Electrotechnical Commission that is developing an industry-wide measurement standard for EMFs in vehicles.

We will continue to monitor evolving research and understanding of EMFs going forward.

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# Autonomous Driving

Once the stuff of science fiction, autonomous vehicles – or cars that drive themselves – are moving ever closer to a reality. Already, we’re manufacturing and selling vehicles with semi-autonomous features that use software and sensors to steer into parking spaces, adjust speed based on traffic flow, or apply the brakes if an imminent collision is detected. We are continuing to develop technologies that allow for more semi-autonomous capabilities to assist the driver.

Also see:

> [Vehicle Safety and Accident Avoidance](#)

Cameras, sonar, radar and lidar<sup>1</sup> all have a role in “seeing” the world, and software can interpret what they are seeing in ways similar to a human driver – sometimes even better. These technologies have the potential to continue to make people better drivers. And, one day, in the right environment, they could even replace drivers.

Our goal isn’t to be first-to-market with a fully autonomous vehicle. Our vision is that autonomous vehicles, combined with vehicle connectivity, should be available for everyone and not just a select few.

Think about the potential benefits autonomous driving could have for the elderly, especially in nations where the average ages are increasing. Many older people feel a loss of independence when they can no longer drive. Autonomous vehicles could extend the driving life of the elderly, allowing them to maintain the personal freedom that comes from mobility. Such technology can improve their quality of life and reduce their dependence on caregivers.

Evolving technology is pushing us to look for new opportunities to solve large-scale problems, like that of aging populations. We are looking for ways that mobility can improve the human condition.

We have fully autonomous vehicles in development for the future, with research vehicles already on the road. We’re working with a number of university partners on research and problem solving, including the following:

- **University of Michigan, Massachusetts Institute of Technology and State Farm.** We have developed an automated Ford Fusion Hybrid that serves as a research platform for real-world testing and data collection. The vehicle, which can sense objects around it and uses advanced algorithms to help it predict where vehicles and pedestrians might move, will help us identify and address some of the challenges surrounding fully automated driving. As our primary research partner, the University of Michigan is co-developing the sensing (“eyes”) and the decision-making algorithms (“brains”) of the “virtual driver” to help the vehicle understand its physical

surroundings and make driving decisions.

- **Stanford University.** We are working together to develop path-planning algorithms that enable a vehicle to automatically maneuver so its sensors can see around obstacles (such as large trucks).
- **Aachen University (Germany).** We are studying when and how human drivers perform certain key driving maneuvers, such as lane changes, so that we can make our vehicle drive in a way that feels intuitive.

As part of our explorations, we're also considering how autonomous driving may affect the traditional mobility ecosystem and the customer experience. That is why we have included autonomous driving as part of our Ford Smart Mobility experiment portfolio and why we have partnered with State Farm so that we can understand the implications autonomous driving may have on vehicle insurance. Through our partnership with the University of Michigan, Ford is one of the founding members of the Mobility Transformation Center, which includes the new "Mcity" test facility scheduled to open in the summer of 2015. In addition to the test facility itself, this partnership will provide us access to researchers working on the legal, political, social, regulatory, economic, urban planning and business issues that must be addressed in parallel with autonomous driving.

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1. Lidar is a remote detection system that works on the same principle of radar, but using light from a laser.

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# Gaining Insights from Global Data and Analytics

The vehicles we make are becoming more connected than ever, with advanced technologies that link vehicles to each other and to the Internet. From in-vehicle sensors to wireless connections, such technological advancements are helping Ford become a more consumer-centric business, giving us new insights into driver behavior.

The data that our vehicles generate allow Ford to better understand our customers, enabling us, in turn, to provide even better services and solutions that anticipate their needs. For example, your car could anticipate when servicing is needed and help you schedule an appointment. Or your vehicle could show you a better route to take to work.

A decade ago, data analytics was all about hindsight. Today, it's about insight. We want to take our data analytics expertise to the next level, turning it into foresight to understand what our customers might want and need so we can create mobility solutions that translate into value for our customers, for society and for our company. We put the customer first, and, through data analysis, we can evaluate patterns and trends that will help us do that even better.

At Ford, we strive to be trusted stewards of our customers' data. And we take the security and privacy of our customers and their data seriously. We aim to be transparent with customers and strive to provide choices about sharing data. When we do use customer data, our goal is that, in return, customers receive services or features that they find valuable, such as coaching on techniques that optimize fuel efficiency or highlighting routes that minimize time in traffic congestion.

In 2014, Ford participated in the development of an [automotive privacy pledge](#) through the Alliance of Automobile Manufacturers. We are working to continuously enhance our privacy and security practices. We have rigorous security testing, conduct assessments of our data systems, and follow industry best practices.

In late 2014, we appointed Ford's first chief data and analytics officer – the first of the major automakers to do so. [Paul Ballew](#) and his team are helping us better understand consumer behavior and accelerate development of the mobility, connectivity and autonomous driving innovations that will improve people's lives. Ballew, who reports to our chief financial officer, is also leading the company's data and analytic efforts globally, establishing an enterprise-wide vision and integrating all of our research, analytics, processes, standards and tools. As part of this mandate, Ford has established an enterprise data governance infrastructure to drive a more holistic approach to data stewardship, including how we address data privacy and security. Our ultimate goal is to better anticipate customers' wants and needs as we implement our Blueprint for Mobility.

Many of our [mobility projects](#) involve experimentation to better understand driving

behaviors. Our Big Data Drive experiment, for example, evaluates driving data from more than 200 Ford employees who volunteered for the project. For this and other Ford Smart Mobility projects, we follow data stewardship principles, including transparency of purpose and choice of participation.

#### Data Prize

Ford has already been recognized for our data analytics work. In 2013, we were awarded the prestigious INFORMS Prize from the Institute for Operations Research and the Management Sciences for using data science and predictive analytics to improve overall operations and performance. Ford uses analytics widely across our company, including in our research, product development, manufacturing, supply chain, marketing and sales, finance, purchasing, information technology and human resources functions.

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# Customer Privacy and Security

Ford is absolutely committed to protecting our customers' privacy. Consistent with the [Auto Alliance Privacy Principles](#) that we adopted in 2014, we do not use data to track our customers, and no data is wirelessly transmitted from our vehicles without customer consent. Connected vehicle data is used by Ford to fulfill customer requests, to troubleshoot or to improve products. The type of data depends on the service.

Our SYNC® communications and entertainment system does not feature an embedded cellular connection; however, some of its features and services can access a data or cellular connection via a customer's connected phone. For example, SYNC's Vehicle Health Report feature uses diagnostic information about the vehicle to provide the customer with a status report of the vehicle's health.

Some of our vehicles do have embedded cellular connections to support our MyFord/MyLincoln Mobile app feature, including our plug-in electric models (the Ford Focus Electric, Fusion Energi and C-MAX Energi) and the Lincoln MKC and MKZ. MyFord Mobile uses location, diagnostic data, and fuel and range data to help customers monitor the conditions of their plug-in hybrids and find electric charging locations.

We provide data to our service providers to fulfill requests by customers. As one would expect, our partners are required to protect this information. Security is also a top priority in our vehicle systems, including connected services. We continue to invest in research to develop innovative solutions that enhance the security of our vehicles.

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# Focusing on Customers

Customers are the very heart of our business. So improving their experience is a large part of our mobility work. And it starts with learning more about how our customers use their cars in their daily lives.

One of our Ford Smart Mobility experiments, called Big Data Drive, works with Ford employee volunteers in Michigan. We're capturing data produced from their vehicles to learn details about their driving behaviors and driving styles, as well as factors such as traffic and weather. The experiment takes the massive amount of data a vehicle produces – upwards of 25 gigabytes of information per hour – to help us understand how people move and see patterns that most customers can't see themselves.

Last year in the Detroit area, for example, a major expressway completely shut down for six months of construction, disrupting some 140,000 drivers who normally take that route. Through Big Data Drive, we were able to map the data of our employee participants and see the implications of the closure so we could track congestion on surface streets by the hour and provide alternate driving routes.

How frequently customers use a car is another area of focus, with a set of experiments that look at more flexible usership experiences and the ecosystem of vehicle sharing. We're exploring flexible mobility options around the world that go beyond just selling and leasing cars. Back in Michigan, hundreds of Ford employees are participating in our Car Swap Experiment, which allows employees to share and swap their vehicles using a mobile app.

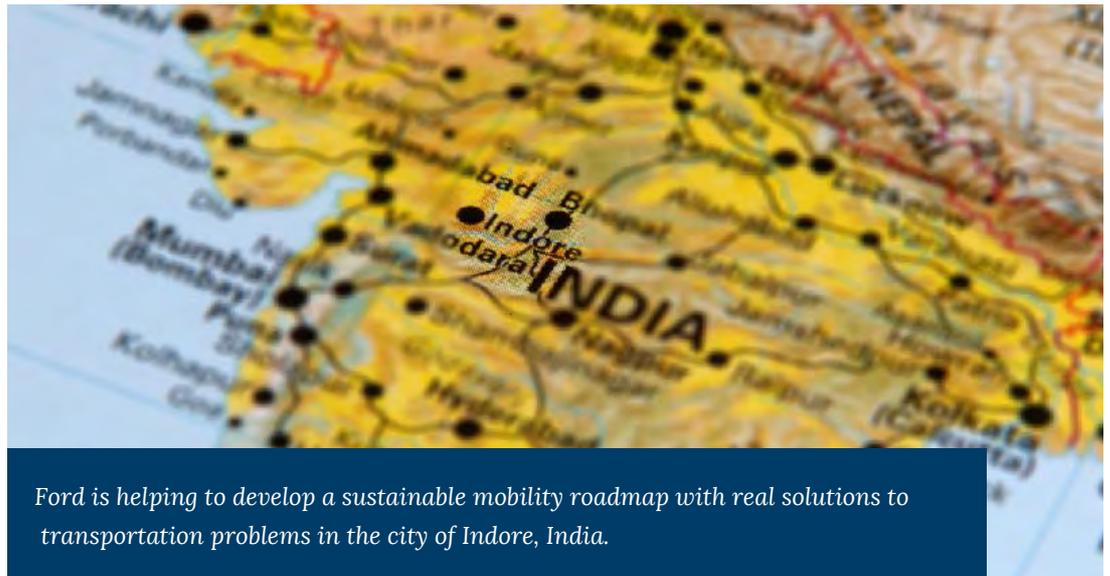
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## Case Study: Working Toward Sustainable Mobility in Indore, India



Ranked among the 10 fastest-growing cities in India, Indore offers the perfect recipe for gridlock. The population has reached 2.4 million residents, outpacing transportation infrastructure development and leaving busy roadways choked with a crowded mix of buses, trucks, motorcycles, cars, rickshaws, carts and pedestrians.

Indore is also one of six global cities participating in the World Business Council for Sustainable Development's (WBCSD) Sustainable Mobility Project (SMP) 2.0.<sup>1</sup> The cross-sector collaboration has a simple objective: speed up and scale up sustainable mobility solutions across a range of transportation options that are specifically selected to address the priorities of each of the demonstrator cities. (The five other cities are Campinas, Brazil; Hamburg, Germany; Lisbon, Portugal; Bangkok, Thailand; and Chengdu, China.)

The six cities were chosen because they are representative of a variety of cities around the world, each with different types of mobility challenges. Successful development of a sustainable mobility roadmap for each of these six cities will demonstrate how the SMP2.0 methodology can be scaled up and applied around the world.

Although Ford is participating at some level across all six cities, we are taking a leadership role with Indore. Our goal is to develop a roadmap for sustainable mobility by the end of 2015 with real solutions to Indore's existing problems.

High-tech solutions, such as those we are exploring in our [mobility experiments](#), are

important for the overall future of mobility as a whole. But for cities like Indore, the immediate answers don't always have to be cutting edge. For example, implementing solutions already commonplace in other major cities, such as dedicated cycle lanes for bike travel or a smart multi-mode ticketing system, could have significant beneficial impacts in Indore.

In January 2015, we launched a trial program to relieve heavy congestion in a shopping district where narrow streets are routinely blocked by vehicles parked every which way. The trial created defined loading and unloading zones and provided free parking garage spaces to shoppers to encourage drivers to leave their vehicles in designated spots.

“Much of what we're looking to do is to change behavior,” says Ganesh Ramakrishnan, one of the Ford team members working on the Indore project. “In many ways, it's really small steps. This focused trial program demonstrated the value of mobility solutions to store owners, who saw benefits because shoppers gained improved access to their goods and services, and to pedestrians, who felt safer walking through less-congested streets.”

At Ford, we want to contribute to a better world, so developing sustainable mobility solutions for a city like Indore ties directly into that goal. We also believe that through participation we will learn and improve our overall mobility strategy and help our company remain relevant through rapidly changing times.

We expect to report on the roadmap solutions for Indore in our 2015/16 Sustainability Report.

#### READ MORE:



Read about some of our other work in India:

[🔗 Medicine in Motion](#)

[📄 Spotlight: Improving the Odds in the “Golden Hour”](#)

1. Ford was a member of the WBCSD between 2000 and 2004, participating in the development of the first iteration of the organization's mobility project, known as SMP 1.0. Because we believe mobility issues cannot be solved by Ford alone, requiring collaboration with other organizations, we renewed our commitment to the Council in 2013 and signed on as a leading contributor to SMP 2.0 in 2014. (The mobility project is just one area of focus for the WBCSD.)

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## Voice: Ken Washington

Ken Washington talks about Ford's mobility work and the company's vision of enhancing the lives of customers.

“ I'm a newcomer to Ford, having joined in 2014. When I first got the call to consider this position, I started thinking about my relationship with my car. I realized how much things were changing. And it convinced me that I wanted to be inside the tent working to make change, not outside looking in.

I think of my job as providing the technical framework and foundation for the future of Ford Motor Company. We're looking over the horizon at what mobility will mean in the years to come. When I use the term "mobility," I'm using it broadly: How will people move? The word has been widely adopted by our industry. But quite frankly, I think a lot of people don't yet have a rich understanding of what the possibilities truly hold.

Just imagine what the future might look like when each vehicle is a node on the Internet. Imagine what you can do when those vehicles are equipped with sensors that can detect the environment around them in real time and interact with other connected parts of our digital lives. Then imagine that you have similar connectivity in public transportation, such as buses and trains. Imagine how you could take all that and weave it together to offer people new ways to move, whether they are trying to get around in densely populated urban environments or rural villages. Imagine how all of this will enable communities to be more efficient, with much smaller carbon footprints.

Here at Ford, we're working to tie together connected vehicles, new modes of vehicle ownership and use, cars that can navigate autonomously, and data that can be processed and analyzed to make transportation experiences much richer and much easier. That's what we mean when we say "Smart Mobility."

Of course, this isn't going to happen tomorrow. But we are absolutely confident that this future is very real, transformative and incredibly exciting. Our vision at Ford is to change how the world moves – again. It's what Henry Ford did a century ago. Now we believe we're going to revolutionize the world once more, this time powered by a new digital economy.

Ford's longstanding culture of innovation has enabled our mobility thinking; it's a natural fit for us. We are absolutely a car and truck company, and we'll continue to be so. But we also



**Ken Washington**  
Vice President, Research and Advanced Engineering  
Ford Motor Company

now think of ourselves as a technology company and a mobility company. If we're going to be disrupted through new innovations – and these innovations are definitely happening – the best way is to disrupt ourselves.

Think of how different today's cars are from those of a decade ago. In some ways, they are hardly recognizable, with more features, smaller engines, better fuel economy – plus they're a lot more fun to drive. The same pace of transformation will continue to accelerate in the future. We're looking at everything from how vehicles will be powered – electrification, fuel cells, natural gas – to the materials that go into the vehicles themselves.

Our new suite of Ford Smart Mobility experiments aims to gain insights into the many changes taking place so we can create transportation experiences that people will love. Some of the experiments won't hit the mark. But we won't know unless we try, which is why we're exploring such diverse areas, both geographically and technically.

People often ask me which experiment is my favorite, and it's hard to choose. I have many favorites, including on-demand driving in London, parking experiments in Atlanta and London, car swapping in Dearborn and car sharing in Bangalore. All of our experiments are aimed at improving lives and creating a better world, be it through improving access to health care, easing congestion on our roadways or reducing carbon emissions by sharing vehicles.

So why are we doing all this mobility work? We know consumer behavior is changing and so is the way individuals think of the automobile. More and more, people will share vehicles or order rides on demand or use multiple modes of public transportation. We want to position Ford as a mobility provider for future generations – as a company that has built consumer trust by anticipating and solving unmet needs. That means providing a full range of mobility services and being ready with great vehicles when and if our customers ask for them.

All the automakers are looking at mobility, connectivity and autonomous vehicles, but we think our strategy sets us apart. With Ford Smart Mobility we're exploring the integration of mobility solutions, connectivity, autonomy and data analytics from a consumer experience perspective. We're thinking of all the ways we can create more enjoyable mobility experiences for our customers. Others seem very focused on trying to be first to market with autonomous vehicles or specific mobility services, but our priority isn't to get there first; it's to serve our customers best. Our vision is to make the future of mobility available to the masses to enhance our customers' lives.”

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## Mobility

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## Voice: Paul Ballew

Paul Ballew talks about the power of data analytics and what it will mean for customers in an increasingly connected world.

“ I am truly honored to be the first data and analytics officer in the history of Ford, although data analysis certainly isn't new to this company. Back in the 1940s, Henry Ford II famously hired the Whiz Kids, a group of 10 World War II veterans who brought the science of statistics and analytics to Ford Motor Company. In today's world, the Whiz Kids would have the time of their lives with the ability to analyze almost unimaginable amounts of data to understand customer behavior and improve fuel economy, reduce traffic congestion or develop new features to boost safety.



**Paul Ballew**  
Global Chief Data and Analytics Officer  
Ford Motor Company

Most people think of big data as something new, but it's a culmination of things that have evolved over half a century, beginning in the post-war era when investments to systematically capture data started to accelerate. Over the last five to 10 years, new technologies and an explosion of information have converged to an inflection point centered on the ability to leverage data and analytics to anticipate the needs of customers and serve them better than ever.

This historic inflection point means that mobility and connectivity – two of the world's most significant transformations – are converging. Prior to the automobile, people spent most of their lives within a 40-mile radius. Then, 100 years ago, Henry Ford put the world on wheels so people could move from one place to the next. More recently, the world has changed yet again to become digitally linked. The power of data analytics will help us deliver mobility and connectivity solutions so seamless they could almost be considered magical.

Technology has opened up the proverbial tap on data. Today, 4 billion people around the world have access to a smart device. In the not-too-distant-future, when we have millions of Ford vehicles on the road that are connected to the Internet, customers can choose to share with us an incredible amount of insight that we can use to design better products and services to meet their needs. Ford is very quickly becoming not just an automobile company but an information company. And, with this information, we can help transform the lives of our customers.

However, as with any transformational moment in human history, there are accompanying societal issues. We take the issues of privacy and security very seriously. We are trusted stewards of customer data. We are respectful of, and humbled by, that trust. We will

continue to respect customer privacy, to be transparent, to provide choice, where appropriate, and to secure data. In that way, customers know how data will be used and choose to share it with us so we can provide even more superior experiences.

Consistent with this commitment, Ford has established a company-wide data governance infrastructure that will drive a more holistic approach to the stewardship of data, including issues such as data privacy and security. We're being innovative in a technological landscape that is constantly shifting.

Data collection is so ubiquitous now that most of us don't give it much thought. When we shop online, we don't consider the advanced algorithms that make suggestions for our next purchases based on prior buying habits, help manufacturers develop and improve products with the features customers want most, or assist retailers in maintaining product inventories. Most people hear the term "big data" but don't really comprehend what it means. It's incumbent upon us to explain why we're going down this path for the benefit of the customer.

From a business standpoint, today's technologies allow us to take the science of data and analytics and combine it with the art of business to anticipate customer needs. Data allows us to know our customers and act on that knowledge in meaningful ways, thereby creating a more customer-centric business model. Historically, very few companies – aside from, say, the corner butcher – have been truly customer-centric. How can you be customer-centric if you don't know your customers? It's a false assertion. With data analytics, we can better understand patterns and trends of customers, enabling us to put them first in game-changing ways.

We want Ford to harness the potential of big data in a way that will make a true difference in the lives of our customers. It's a once-in-a-century opportunity, and we want to be sure we're making the right investments and focusing on the right priorities.”

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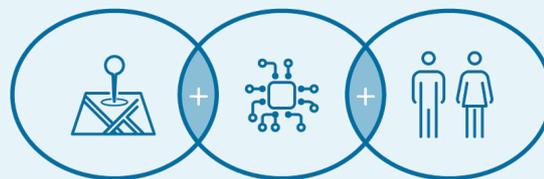
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## Spotlight: Getting a Handle on Mobility



*Can electric bikes help ease the daily commutes for those who use multiple modes of transportation? We're experimenting to find out.*



*Cities + Technology + People =  
Improving Transportation Systems*

The idea of biking to work may sound appealing for many suburb-to-city commuters. But the reality is not always so easy or so practical – especially if the daily journey also involves a car. (Traditional bikes don't typically fit in a traditional vehicle.) As part of our experimentation around different modes of transit, we recently unveiled two concepts to show how electric bikes, or e-bikes, can work seamlessly with cars and public transport to enable faster, easier commutes and help businesses operating in urban centers.

The Handle on Mobility experiment aims to take some of the anxiety out of journey planning and improve the quality of life in busy cities. As

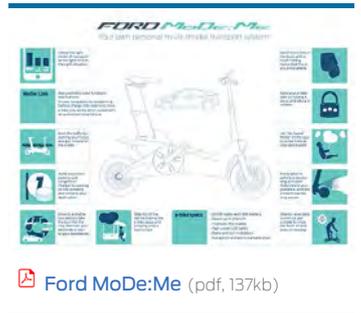


**Megatrend: Disruptive innovation and big data**

We live in an extraordinary era of disruptive innovation. In 2020, computers are anticipated to be about 200 times faster than today and to have memories 1,000 times as large. Experts also forecast a 10-fold increase in global mobile data traffic between 2014 and 2019 while information and communication technology systems become

a starting point, we challenged Ford employees around the world to submit designs for e-bikes, which are typically more portable and more versatile than traditional bicycles. The prototype MoDe:Me and MoDe:Pro e-bikes were among the top designs from more than 100 submitted.

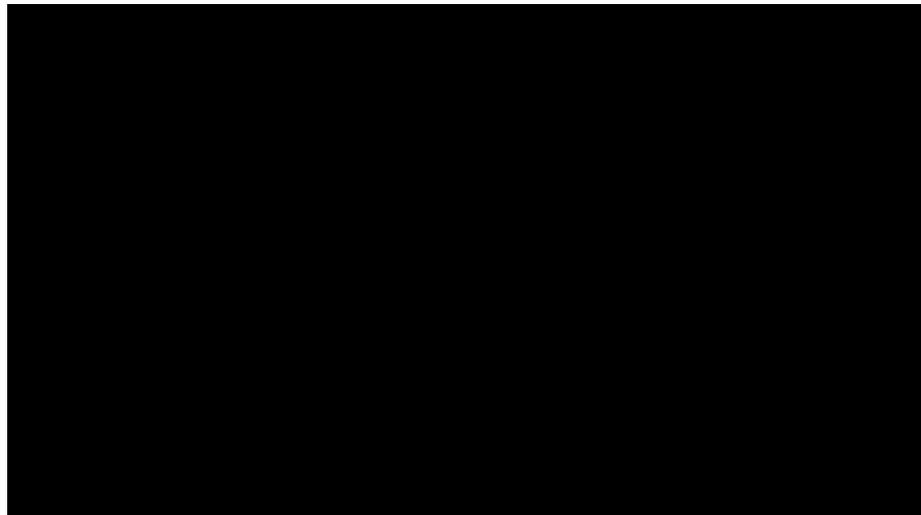
Both are designed to fit easily into Ford vehicles and are equipped with a 200-watt motor with a 9-amp-hour battery that provides electric pedaling assistance for speeds of up to 25 kilometers/hour (15.5 mph). The prototypes offer technologies inspired by those already in our automobiles, such as a rear-facing ultrasonic sensor that warns the cyclist, via vibrating handlebars, when a vehicle is overtaking. The sensor also alerts motorists of the presence of the e-bike by illuminating handlebar lights.



Each e-bike was designed to meet the needs of different users. The MoDe:Me, for example, is intended for a suburban commuter, who can park on the city outskirts, take the e-bike onto public transport and travel to the urban center, then ride the e-bike to a final destination. The MoDe-Pro e-bike is intended for urban commercial users, such as couriers and goods and delivery services. It is designed to stow safely into commercial vehicles, such as the Transit Connect, which can act as a carrier and support vehicle and be combined with more than one e-bike.

Compatible with the iPhone 6, the e-bikes use a prototype app that helps with route planning and navigation. The app also updates the route as circumstances change, showing, for example, if a train service is canceled.

*Check out this video:*



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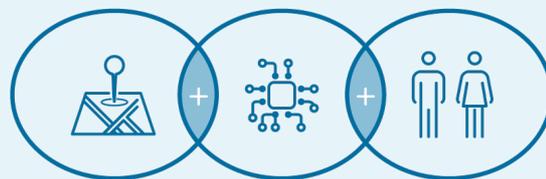
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# Spotlight: Improving the Odds in the “Golden Hour”



*Ford’s “Golden Hour Challenge” was just one of our experiments designed to improve global mobility in an increasingly congested world.*



*Cities + Technology + People =  
Improving Medical Care*

In emergency medicine, it’s known as the “Golden Hour” – the 60-minute window of time following a traumatic injury. Patients who receive prompt medical attention within that critical one-hour period are much more likely to survive than those who do not. But in Delhi, India, congested roadways make it extremely difficult for emergency crews to arrive on an accident scene in a timely manner. Enter Ford’s “Golden Hour Challenge” – just one of our experiments designed to improve global mobility in an increasingly congested world.



### Megatrend: Urbanization

At no time in mankind’s history have city populations been so dense. This density brings great opportunities to live sustainably, but also puts greater pressure on infrastructure and natural resources.

> [Global Megatrends](#)

In 2015, we announced 25 mobility experiments testing new concepts that will address future mobility needs. The Golden Hour was part of our Innovate Mobility Challenge Series, which started in 2014 as a contest inviting innovators and developers to “crowd-source” solutions for specific mobility problems.

Like many large urban cities, Delhi has a significant number of road accidents each year. In 2013, for example, the city reported a total of 7,569 road accidents, more than 1,830 of which resulted in a fatality.<sup>1</sup> With a population of nearly 10 million people, daily gridlock is a constant problem – and that gridlock can have a big impact on emergency vehicles. The Delhi mobility challenge tasked developers to submit solutions that would either decrease the time to get to treatment or to a trauma center or increase the availability of information related to treatment needs within the Golden Hour.

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*Ford's Innovate Mobility Challenge Series incentivizes “crowd-sourced” solutions to mobility problems.*

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The \$15,000 grand prize winner – an app called Flare – was created by a student team from the University of Illinois at Urbana-Champaign. Flare was designed to establish a volunteer community to help others in need, while authorities oversee operations. The app allows users to report an accident or learn of one near them so they can volunteer to help. Users can post photos, show their locations on a map, send messages to report what happened, or view other reports to see if they can assist.

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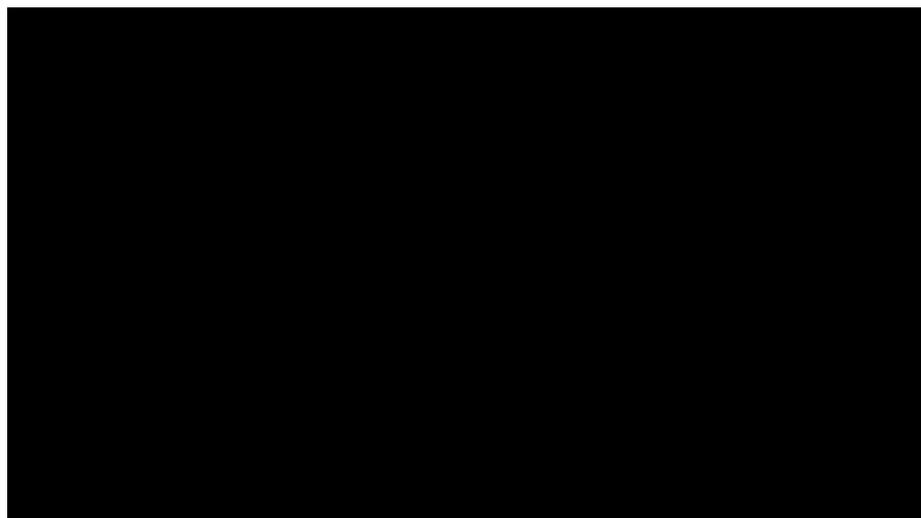
*Flare, the winning app, allows users to report an accident or learn of one near them so they can volunteer to help.*

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“Ford’s Innovate Mobility Challenge is a fabulous program,” says Dhruv Diddi, one of Flare’s creators. “It inspires and incentivizes people from all walks of societies to come up with ideas which actually have a real impact on the transportation world.”

The Delhi challenge was part of a broader Ford initiative – Sustainable Urban Mobility with Uncompromised Rural Reach, or SUMURR – that focuses on helping communities in developing nations.

*For more on Flare, check out this video:*



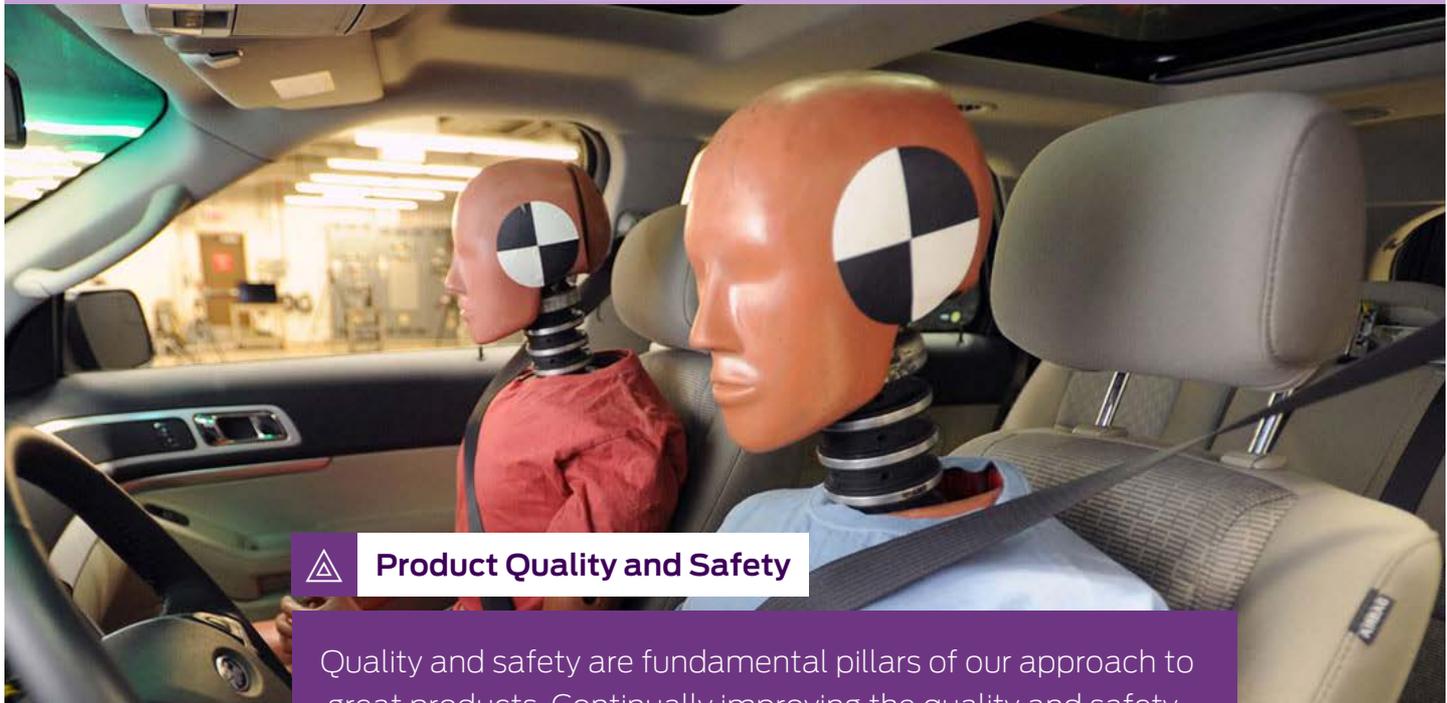
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1. National Crime Records Bureau, Ministry of Home Affairs, Government of India, 2013 report.

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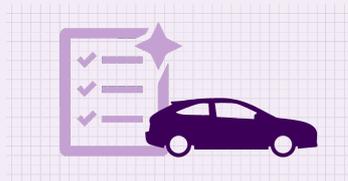


### Product Quality and Safety

Quality and safety are fundamental pillars of our approach to great products. Continually improving the quality and safety of our products is a central mission of all our employees.

#### Product Quality and Safety

- Customer Satisfaction and Quality
- Vehicle Safety and Accident Avoidance
- Data



#### Relentlessly Improving Quality

Our relentless efforts to improve quality are paying off: key quality and customer satisfaction metrics are trending up across our regions.

- Customer Satisfaction and Quality



#### Safety and Driver Assist Innovations

As technology and driving environments evolve, we're continuing to implement innovative technologies that enhance vehicle safety and performance.

- Vehicle Safety and Accident Avoidance



#### Encouraging Safer Driving

Through both teaching and technologies, we're helping to encourage safer behavior on the roadways for novice and experienced drivers alike.

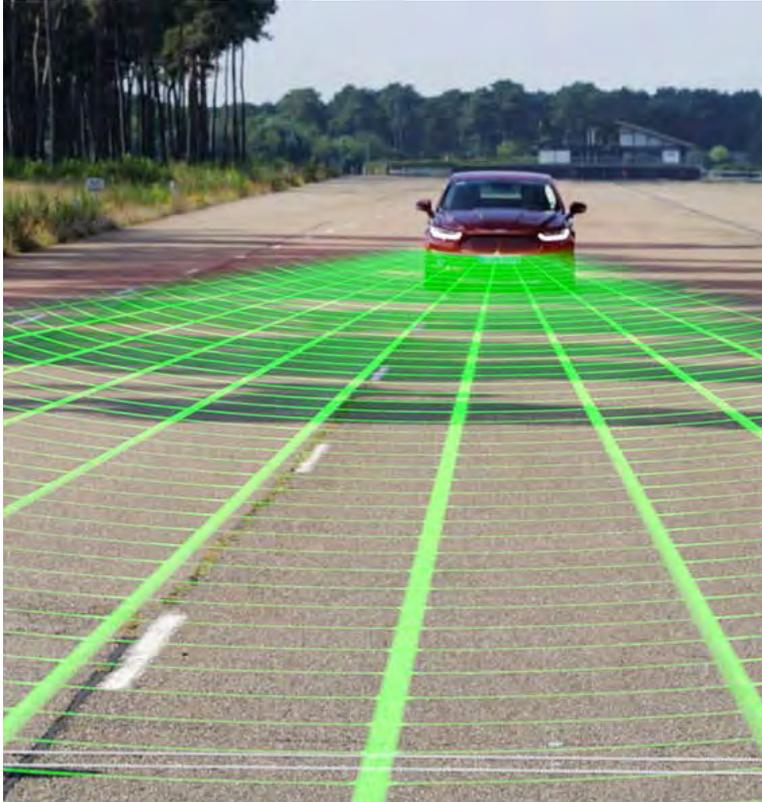
- Encouraging Safer Driving

#### RELENTLESSLY IMPROVING QUALITY

We use an extensive Global Quality Operating System at every stage of vehicle development. After our vehicles are sold, we

continue to evaluate performance so we can develop and implement improvements.

> Customer Satisfaction and Quality



#### SAFETY AND DRIVER ASSIST INNOVATIONS

The safety and driver assist technologies we are implementing today are making driving safer and more convenient. Moreover, they are moving us toward the autonomous and connected vehicles of the future.

> Vehicle Safety and Accident Avoidance

#### ENCOURAGING SAFER DRIVING

We developed Ford Driving Skills for Life to help new drivers improve their skills. On the technology side, the innovative Ford MyKey<sup>®</sup> system is designed to help parents encourage their teens to drive more safely.



> Encouraging Safer Driving

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## Product Quality and Safety

### Customer Satisfaction and Quality

Regional Quality Performance

### Vehicle Safety and Accident Avoidance

### Data

# Customer Satisfaction and Quality

When customers purchase something as expensive as a new vehicle, they expect a high-quality product. They also expect high-quality service in their sales, vehicle service and financing experience. That’s why quality is a top priority at Ford and a central mission of all of our employees.

We have worked tirelessly to improve quality over the past decade, and we have made great strides. We use an extensive Global Quality Operating System (GQOS) at every stage of vehicle development and manufacture to make sure that our vehicles meet or exceed customer expectations.

## Meeting and Exceeding Customer Expectations

We begin designing for quality from the very earliest stages of every vehicle program. Years before a new model rolls off the assembly line, we define the right features and content to include based on extensive customer research, and we validate that our vehicle designs and manufacturing processes will deliver vehicles that meet or exceed customer expectations. Our engineers use a suite of high-tech design tools and virtual manufacturing technologies to detect and avoid potential issues. We also test vehicle prototypes extensively to ensure customers will experience a high level of quality in our products. After our vehicles are sold, we continue to evaluate vehicle performance and use this information to develop and implement effective solutions. We also gather feedback from customers using survey tools that track and evaluate our quality and customer satisfaction performance.

*We begin designing for quality from the very earliest stages of every vehicle program.*

We have made substantial progress recently with the quality of our vehicles. Our latest “things gone wrong” data shows that our quality is improving in North America and South America and is at best-ever levels in Europe and Asia Pacific. We have focused on improving quality in areas such as infotainment, transmissions and interiors, and these efforts have paid off. We also are working to improve our [Global Product Development System](#) to ensure the process improvements we make flow throughout our system, resulting in more-efficient vehicle launches, fewer downstream changes, improved timing and further quality improvements. As a result of these efforts and the migration to our high-quality global platforms, customer satisfaction is trending up.

*Quality is improving in North America and South America and is at best-ever levels in Europe and Asia Pacific.*

## Addressing Key Issues

Nonetheless, we had some quality and customer satisfaction issues in 2014. For example, we had 40 U.S. safety recalls, which is higher than in previous years. This increase was due in part to the U.S. National Highway Traffic Safety Administration (NHTSA) expanding their definition of safety defects, which has led to the highest number of safety recalls in the U.S. across all auto manufacturers. In addition, over the past several years we have been

dramatically increasing the innovative technologies in our vehicles, the number of new models we introduce and the speed with which we release them. These trends also put increased pressure on both our own and our suppliers' design, production and quality systems. However, while we know that introducing new products and technologies is critical to our business, we also have to take the time to make sure everything about our new vehicles is just right before they go to market.

We are focused on addressing quality and customer satisfaction concerns and delivering on our promises to consumers. We have enhanced our culture of cooperation and focus on solving problems, so that when quality issues arise, we can address them quickly and effectively. We strive to ensure that we learn from every quality issue so that our overall performance continues to improve.

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*We strive to learn from every quality issue.*

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## Tracking Our Progress

We track our progress on quality through a combination of internal and external measurements that assess how we are doing and where we can improve. The Global Quality Research System (GQRS), which tracks customer satisfaction and “things gone wrong,” is our primary quality survey. It is implemented for us quarterly by the RDA Group, a market research and consulting firm based in Bloomfield Hills, Michigan. We also subscribe to J.D. Power and Associates' Initial Quality Study, their Vehicle Dependability Study, and their Automotive Performance, Execution and Layout (APEAL) Study. Furthermore, we track warranty claims and costs internally.

### READ MORE:

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*Read more about quality performance across our operating regions.*

> [Regional Quality Performance](#)

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*See our full set of quality performance data.*

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## Product Quality and Safety

∨ Customer Satisfaction and Quality

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∨ Data

# Regional Quality Performance

The following are key measures of our vehicle quality.<sup>1</sup>

## In North America in 2014:

- Customer satisfaction was 79 percent, compared with 78 percent in 2013.
- Full-year “things gone wrong” (TGW) was 1,392 per 1,000 vehicles, compared with 1,650 in 2013, an improvement of 16 percent.
- The number of Ford Motor Company safety recalls increased from 16 in 2013 to 40 in 2014; the number of affected units increased from 1.2 million to 4.9 million.
- Ford’s customer satisfaction with dealership sales experiences improved 5 points compared with 2009 but declined 1 point compared with 2013. Customer satisfaction with vehicle service experiences improved 1 point compared to 2009 but declined 2 points compared with 2013.
- Warranty spending increased by 16.4 percent in 2014, compared with 2013.

## In Europe in 2014:

- Customer satisfaction increased to 73 percent, up 2 percentage points from 2013.
- Full-year TGW was 1,302 per 1,000 vehicles, unchanged from 2013.
- Sales satisfaction with dealer or retailer increased by 1 point compared with 2013. Service satisfaction with dealer or retailer increased by 2 points compared with 2013.<sup>2</sup>
- Warranty spending increased by 15.0 percent compared with 2013.

## In Asia Pacific in 2014:

- Customer satisfaction increased to 69 percent, up 1 percentage point compared with 2013.
- Full-year TGW was 917 per 1,000 vehicles, compared with 941 in 2013, a 3 percent improvement.
- Sales satisfaction with dealer or retailer improved 9 points from 2013 to 2014. Service satisfaction with dealer or retailer improved by 8 points in that time.
- Warranty spending decreased by 3.8 percent compared with 2013.

## In South America in 2014:

- Customer satisfaction was 68 percent, up 3 percentage points compared with 2013.
- Full-year TGW was 1,472 per 1,000 vehicles, compared with 1,724 in 2013, a 15 percent improvement.
- Sales satisfaction with dealer or retailer improved by 3 points from 2013 to 2014. Service satisfaction with dealer or retailer decreased by 1 point in that time.
- Warranty spending decreased by 11.6 percent compared with 2013.

## In Middle East and Africa in 2014:

Customer satisfaction was 62 percent compared with 63 in 2013.

- Full-year TGW was 1,046 per 1,000 vehicles, compared with 1,311 in 2013, a 20 percent improvement.
- Sales satisfaction with dealer or retailer improved 2 points from 2013 to 2014. Service satisfaction with dealer or retailer was unchanged in that time.<sup>3</sup>
- Warranty spending decreased by 5.6 percent compared to 2013.

## Owner Loyalty

Owner loyalty is a measure of customers disposing of one Ford product and buying a new Ford product. In the U.S., owner loyalty increased in 2014 to 50.4 percent, compared with 49.9 percent in 2013. In Europe, Ford owner loyalty increased to 54 percent, compared with 51 percent in 2013.

### READ MORE:

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*See our full set of quality performance data.*

[Product Quality](#)

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1. Global Quality data has been removed from this and future reports. Global Quality performance is dependent on regional operations, therefore we will continue to report regional quality data moving forward. Things Gone Wrong, Customer Satisfaction, and Warranty Spending data are based on model years, Sales and Service Satisfaction data are based on calendar years.
  2. European sales and service satisfaction with dealers and retailers are net promoter scores based on 22 European markets, including Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, the Netherlands, Norway, Poland, Portugal, Romania, Russian Federation, Spain, Sweden, Switzerland, Turkey and the United Kingdom.
  3. For 2011–2013, Middle East sales and service satisfaction data is based on the following countries: Saudi Arabia, Kuwait, UAE, Oman, Bahrain, and Qatar. In 2014, we added, Jordan, Iraq, and Lebanon to the survey.

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# Vehicle Safety and Accident Avoidance

Ford has a long history of developing and implementing new innovations that improve the safety performance of our vehicles. In 1955, for example, we were the first automaker to offer factory-installed safety belts.

We continue that legacy of innovation today, implementing a wide range of technologies that help to improve the safety of our vehicles. For example, in 2010 Ford introduced the first-ever production automobile rear inflatable safety belts, and in 2014 we introduced an all-new inflatable airbag restraint design in the 2015 Ford Mustang.

As technology and driving environments evolve, we're continuing to implement innovative technologies that enhance vehicle safety. For example, we are implementing vehicle safety and driver assist technologies today that help us move toward the new mobility options we envision in our [Blueprint for Mobility](#). Our vehicles today have radar- and camera-based technologies that are a first step toward Ford's vision of autonomous vehicles. We are also working on vehicles that communicate with each other and with the world around them; these capabilities will be key elements of the integrated transportation ecosystem we envision for the future.

As vehicle ownership expands in emerging economies, we are working to address issues associated with increasing traffic congestion and populations with a high percentage of first-time drivers. Through our [Ford Driving Skills for Life program](#), for example, we are helping new drivers in emerging markets to become better and safer drivers.

*We are implementing innovative technologies to enhance vehicle safety today and move towards Ford's vision of autonomous and connected vehicles.*

*We are also encouraging safer driving through the Ford Driving Skills for Life program.*

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# Vehicle Safety Highlights

The following are key highlights of our recent safety and driver assist performance:

- For the 2015 model year, 15 Ford Motor Company vehicles earned the highest possible Overall Vehicle Score of five stars in the New Car Assessment Program (NCAP) of the U.S. National Highway Traffic Safety Administration (NHSTA). These five-star vehicles include the Ford Edge, Explorer, F-150, Taurus, Fusion, Fusion Energi, Mustang Coupe, Expedition, Navigator and Transit Connect and the Lincoln MKS and MKZ.
- In the 2014 Euro NCAP assessments, the Ford Mondeo earned a five-star safety rating, and the Ford Tourneo Courier received a four-star result.
- Ford has an industry-leading total of seven Euro NCAP Advanced rewards, for our Lane-Keeping Aid, Active City Stop, Forward Alert, Lane-Keeping Alert, MyKey®, Emergency Assistance and Driver Alert technologies.
- The Ford Fusion received a five-star rating in the China NCAP assessments.
- MyKey, Ford's innovative technology designed to help parents encourage their teenagers to drive more safely, is now in more than 9 million Ford and Lincoln vehicles on the road globally and is available on nearly all Ford Motor Company retail vehicles in North America.
- Our available rear-seat inflatable safety belts, which launched on the 2011 Ford Explorer, were selected for showcase in 2014 at the Innovation Festival at the Smithsonian National Air and Space Museum in Washington, D.C. For the 2015 model year, these safety belts are available in North America on several Ford and Lincoln vehicles, including the Ford F-150, Fusion, Explorer, Flex and Edge and the Lincoln MKZ and MKT.
- The availability of Lane-Keeping System, a driver assist feature, has been expanded in North America to include more vehicles, and it will be expanded further for the 2015 model year.
- Curve Control, an enhancement to stability control that helps slow the vehicle when it senses the driver is taking a curve too quickly, is available on select vehicles in North America and Europe.
- We launched the new Pre-Collision Assist with Pedestrian Detection on the all-new 2015 Ford Mondeo. This feature can detect pedestrians in the road ahead, and people who could cross the vehicle's path, and automatically applies the brakes if the driver does not respond to warnings.

### READ MORE:

We're implementing accident avoidance and driver assist

We are implementing technologies that further enhance occupant

We're implementing post-crash response technologies.

technologies.

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protection in a wide variety of crash circumstances.

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# Encouraging Safer Driving

Driver behavior is a key contributing factor in many vehicle crashes.<sup>1</sup> We have developed and support an array of programs and technologies that help to encourage safer behavior on the roadways, for both experienced and novice drivers.

Ford Driving Skills for Life (Ford DSFL), our free driver education program, is a centerpiece of our commitment to help new drivers improve their motoring skills. Ford DSFL was established in 2003 by Ford Motor Company Fund and Community Services, in partnership with the Governors Highway Safety Association (GHSA) and a panel of experts, to teach newly licensed teen drivers skills for safe driving – beyond what they learn in standard driver education programs. [The Ford DSFL website](#) includes an array of free resources for novice drivers, including an interactive Web-based training called The Academy.

*We plan to extend our Ford Driving Skills for Life program to 30 countries before 2016.*

We now offer the program in the U.S., Europe and Asia Pacific. In total, Ford DSFL is training drivers to be safer in 23 countries around the globe and plans to grow to 30 before 2016. As we expand the program outside the U.S., we have adapted it to meet the needs of drivers in different regions.

## Ford DSFL in North America and Europe – Helping Teens Become Safer Drivers

In North America and Europe, Ford DSFL programs focus on helping teenagers – the primary age group of first-time drivers in these regions – drive more safely. The program helps to build skills in four key areas: driver distraction, speed and space management, vehicle handling and hazard recognition. In 2014, we also introduced new driver distraction curriculum, which addresses (among other things) the new trend of taking “driving selfies.”

In the U.S., Ford DSFL has been focusing on teen drivers through five signature programs:

- **The Ford DSFL National Tour:** In 2014 the Ford DSFL National Tour reached out to more teens, parents and educators than ever before, traveling to more than 10 cities in the U.S. with 44 hands-on training sessions. During these visits, teens are invited to hands-on driving clinics that build skills in key areas: driver distraction, speed/space management, vehicle handling, hazard recognition and impaired driving. In 2015, we plan to increase the scope of this program by holding 78 training sessions across 20

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states. Tentatively, our plans for 2015 including taking the tour to cities in Florida, Texas, Illinois, Michigan, Pennsylvania, Massachusetts, West Virginia, New Jersey, Delaware, Nebraska, Iowa, Wisconsin, North Dakota, South Dakota, Wyoming, California, Indiana, Arizona, New Mexico and Hawaii.

- **Taking the Lead:** Our Taking the Lead program in Pittsburgh, Pennsylvania – co-sponsored by Ford Motor Company Fund and Community Services, Westfield Insurance, the GHSA and Allegheny County Pretrial Services – brings a one-hour presentation on safe driving to high school assemblies. The assemblies include a question-and-answer segment with a panel of experts.
- **Operation Teen Safe Driving:** Operation Teen Safe Driving is sponsored in partnership with the Illinois Department of Transportation, the Secretary of State and the state police. The program gets Illinois high school students directly involved in safe driving behaviors by challenging them to develop and implement teen safe driving community-awareness campaigns using Ford DSFL resources. Since the program's launch in 2007, teen vehicle crash deaths in Illinois have decreased 55 percent.
- **Strive 4 a Safer Drive (S4SD):** Launched in 2011, Strive 4 a Safer Drive provides funding to Michigan schools to assist in creating peer-to-peer traffic safety campaigns. The campaigns seek to educate classmates and the community about teen safe driving through various activities. Modeled after Operation Teen Safe Driving, S4SD is sponsored by Ford Motor Company Fund and Community Services, the Michigan Office of Highway Safety Planning and AAA Michigan.
- **Be in the Zone:** The Be in the Zone program focuses on improving teen driver safety among rural youth in Tennessee through peer-generated anti-texting campaigns. Be in the Zone was launched in partnership with the Monroe Carell Jr. Children's Hospital at Vanderbilt University in 2011.

In 2014, we launched Ford DSFL programs in **Canada**, hosting events for teenagers in the Toronto and Calgary areas. The Canadian Ford DSFL program will return to Toronto and Calgary in 2015 as well as conduct training in Windsor and Vancouver.

In late 2013, we launched Ford DSFL for the first time in **Europe**. Since then, we've invested nearly \$7.5 million to provide free, hands-on training to more than 6,100 young drivers in Belgium, Romania, France, Germany, Italy, Spain, the U.K. and Russia through more than 130 events. Thousands more have received training through our online programs. In 2015, the European team plans to expand training to Denmark, The Netherlands and Turkey.

## Ford DSFL in Asia Pacific, the Middle East and Africa – Advancing Safe and Eco-Driving among First-Time Drivers

In many Asian, Middle Eastern and African markets, it's not just teenagers who are first-time drivers. As more and more people are able to afford vehicles, the number of people of all ages who are driving a car for the first time is increasing rapidly. In many of these developing markets, the percentage of drivers who are first-time drivers is much higher than in developed markets. In our Asia Pacific markets, therefore, Ford DSFL is aimed at novice drivers of all ages. In this region the program places equal emphasis on safe driving and eco-driving, as customers are interested in both. In 2014, the program continued in mainland China, India, Taiwan, Thailand, Indonesia, Vietnam and the Philippines, and also expanded to Malaysia and Myanmar, training another 15,000 people.

Overall, more than 90,000 individuals have been trained in the Asia Pacific, Middle East and Africa regions since the program began. In 2015 we will expand to Australia. In the Middle East and Africa region, we launched Ford DSFL in 2012 in Dubai, United Arab Emirates, and

expanded it to Saudi Arabia in 2014. In 2015, we plan to expand the program to Oman, Bahrain, Qatar and the United Arab Emirates.

## Encouraging Safer Driving through Innovative Technologies

On the technology side, the Ford MyKey® system is an innovative technology designed to help parents encourage their teenagers to drive more safely. MyKey is now in more than 9 million Ford and Lincoln vehicles on the road in the U.S. MyKey allows owners to program a key that can limit the vehicle's top speed to one of several preset values and also can invoke SYNC®'s Do Not Disturb feature, which sends incoming phone calls and text messages to the paired phone's mailbox. MyKey encourages safety belt usage by enabling Ford's Belt-Minder® to chime every minute indefinitely until both of the front passengers are buckled in, rather than ceasing after five minutes, and also through a "no belt/no tunes" feature that mutes the audio system until the belt is buckled. In addition, MyKey provides a low-fuel warning earlier than the standard vehicle setting; sounds speed-alert chimes; and will not allow manual override of other safety systems. MyKey is available on nearly all Ford Motor Company retail vehicles in North America, and its availability is expanding to other regions.

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1. U.S. Department of Transportation, National Highway Traffic Safety Administration, [National Motor Vehicle Crash Causation Survey: Report to Congress](#) (Washington, DC: U.S. DOT, July 2008).

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# Accident Avoidance and Driver Assist Technologies

A variety of Ford technologies can assist drivers by helping to control the vehicle or alerting the driver to potential collisions. Also, these technologies can support routine driving tasks by improving comfort and reducing demands on the driver.

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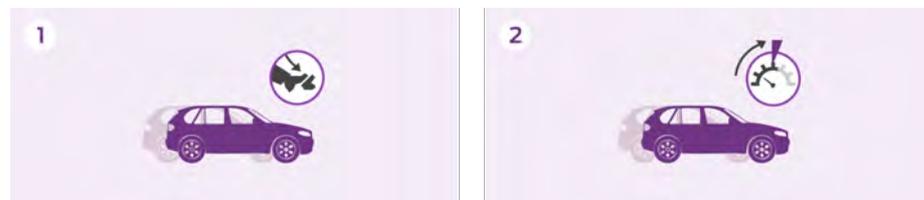
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In the near term, driver assistance technologies are expected to add semi-autonomous capabilities, which provide drivers more assistance in certain situations, such as when changing lanes, in traffic jams or on freeway trips. The driver is expected to remain in the loop to take control, if required.

## Ford Technologies

The following accident avoidance and driver assist technologies are offered on Ford vehicles today.

### Adjustable Speed Limiter Device



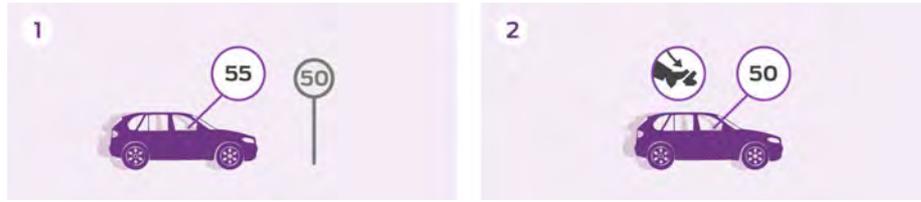
Adjustable Speed Limiter Device (ASLD) allows the driver to set a speed limit that cannot be exceeded by standard gas pedal operation. The driver can override the limit, however, by pressing the accelerator pedal beyond normal usage limits (>90 percent pedal travel). ASLD is offered on select Ford Motor Company vehicles in Europe and China.

### Traffic Sign Recognition



Traffic Sign Recognition uses a forward-facing camera that recognizes speed limit signs that use the standards of the Vienna Convention on Road Signs and Signals. The identified speed is then indicated in the instrument cluster to inform the driver of the speed limit. Traffic Sign Recognition will also warn the driver if the speed limit is exceeded. This feature is available in Europe.

## Intelligent Speed Assist



Intelligent Speed Assist (ISA) is an enhancement of the ASLD system. It combines ASLD with Traffic Sign Recognition in order to adjust the set speed automatically to the detected speed limit. The driver has the option to set a permanent offset that is added to the detected speed limit. Additionally, the driver can still adjust the set speed manually and has the option to override the limitation by accelerator pedal kick-down. ISA is available in Europe.

## Active City Stop



Using a forward-looking LiDAR sensor, Active City Stop is designed to detect objects in front of the vehicle and constantly calculate the braking force required to avoid a collision. If the estimated braking force exceeds a given level without the driver responding, the danger of a collision is considered imminent and the system automatically reduces throttle input and applies the vehicle brakes. The system is designed for speeds up to 50 km/h (31 mph). Active City Stop is available on select Ford vehicles globally outside North America.

## Adaptive Cruise Control



Adaptive Cruise Control (ACC) helps drivers maintain a preset distance from the vehicle they are following, using a radar module mounted at the front of the vehicle that measures the gap and closing speed to the vehicle ahead. The system automatically adjusts the speed of the car to help maintain a preset distance from the vehicle in front. ACC maintains a preset speed if no vehicle in front is detected. If the radar sensor becomes blocked by snow, ice or mud, the driver receives a notice of reduced or suspended functionality. ACC is available on certain Ford and Lincoln vehicles in North America, Europe and China.

## Forward Collision Warning with Brake Support



Ford's Forward Collision Warning with Brake Support technology uses the same radar module as Adaptive Cruise Control to detect range and speed. Forward Collision Warning

with Brake Support activates a visual and audible warning when the system detects a high risk of collision with the vehicle in front. In addition, the brake system is precharged and the “servo boost” assistance system is modulated to provide faster brake activation (e.g., as soon as the driver lifts the gas pedal), if required by the driver. As with ACC, if the sensor becomes blocked, the driver receives a notice of reduced or suspended functionality. This technology is available on certain Ford and Lincoln vehicles in North America, Europe and China.

## Pre-Collision Assist with Pedestrian Detection



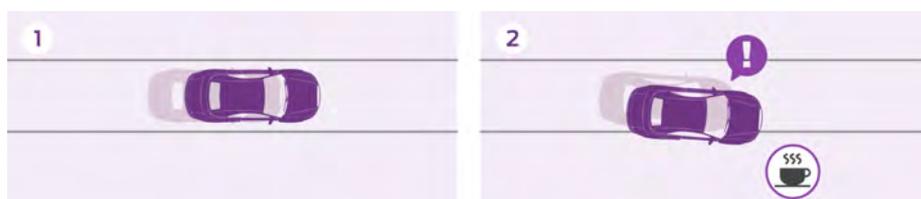
Pre-Collision Assist with Pedestrian Detection uses radar and camera technology to scan the roadway ahead and, if a collision risk with a vehicle or pedestrian is detected, provides a warning to the driver. If the driver does not respond in time, the system can automatically apply up to full braking force to help reduce the severity of or even eliminate some frontal collisions. Pre-Collision Assist may help drivers avoid rear-end collisions with other vehicles at all speeds, while Pedestrian Detection can help the driver avoid pedestrians at lower speeds – and both may reduce the severity of forward collisions or even prevent certain forward collisions. While this new system may be especially helpful in unexpected situations, it does not surmount certain driving challenges, including night-time, low and harsh lighting conditions, vehicles moving in a different direction and certain weather conditions. This technology is available in Europe.

## Lane-Keeping System



Our Lane-Keeping System consists of two elements to help a driver maintain proper lane position: Lane-Keeping Alert and Lane-Keeping Aid. Using a forward-facing camera behind the interior rearview mirror, the system “looks” down the road, monitoring lane lines. Lane-Keeping Alert is designed to warn the driver, via a three-pulse vibration in the steering wheel, when the front-view camera detects that an unintentional lane departure is happening. Lane-Keeping Aid goes a step further, applying a steering torque in the direction the driver needs to steer to keep the vehicle in the current lane. The Lane-Keeping System is available on select Ford and Lincoln vehicles in North America, Europe and China. On some European Ford vehicles, Lane-Keeping Alert and/or Driver Alert (described below) are available separately.

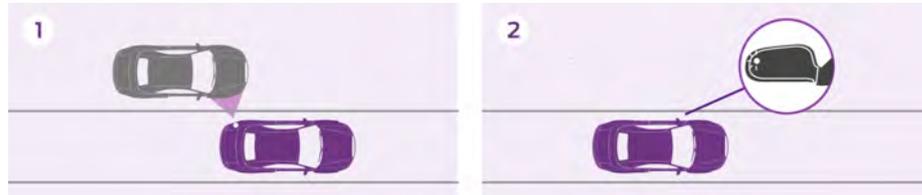
## Driver Alert System



The Driver Alert System uses the same forward-facing camera as our Lane-Keeping System. The system “looks” down the road and monitors lane lines. Based on the vehicle’s

position within the lane and the vehicle state (yaw-rate), Driver Alert continuously assesses the driver's ability to perform the lane keeping task and computes a "vigilance level," which can be displayed in the instrument cluster upon request. If the vigilance level falls below a certain level (e.g., if the driver gets tired), visual and audible warnings are given. The warning happens in two stages. At first, the system issues a temporary warning that a rest should be taken. This message will only appear for a short time. If a rest is not then taken, a further warning may be issued and will remain in the information display until cancelled.

## Blind Spot Information System with Cross-Traffic Alert



Blind Spot Information System (BLIS) with Cross-Traffic Alert (CTA) uses rear corner-mounted, side- and rear-looking radar that detect other vehicles around the car and illuminates an indicator lamp in the side-view mirrors when driving forward. When backing out of a parking space, the same sensors can detect vehicles approaching from the sides, illuminate the indicator lamp in the side view mirror, provide a text alert in the cluster and sound a warning chime. BLIS with CTA is available on certain Ford and Lincoln vehicles.

## Rear View Camera



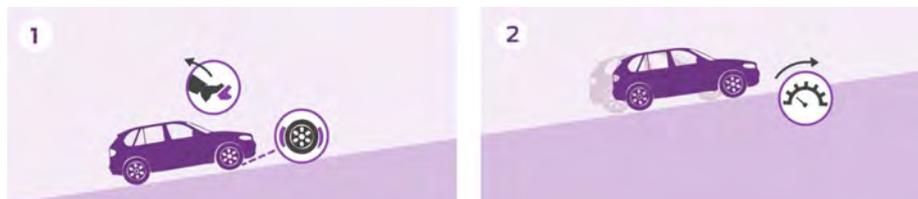
Our Rear View Camera transmits an image of what is behind the vehicle when the driver shifts to reverse. Rear View Camera is available on every Ford and Lincoln vehicle in North America and several Ford vehicles in Europe.

## Active Park Assist



Active Park Assist uses ultrasonic sensors, while the driver is slowly driving near parking spots, to measure the space available. When a suitable parking space is found, Active Park Assist can steer the car into the parking space while the driver controls the shifting, accelerator and brake. Active Park Assist is available on certain Ford and Lincoln vehicles in North America, Europe and China.

## Hill Start Assist



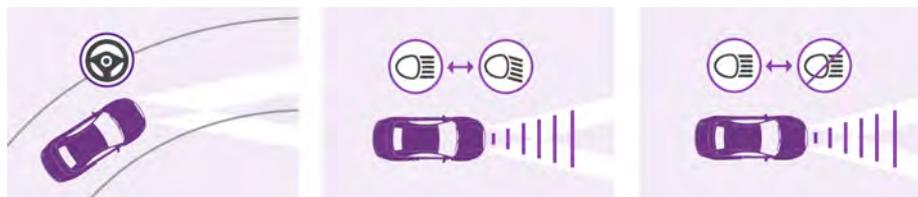
Hill Start Assist helps the driver when starting the vehicle on an uphill gradient by holding the brakes while the driver moves his foot from the brake pedal to accelerator pedal. This system is available standard on most new Ford and Lincoln vehicles in North America and Europe.

## Curve Control



Curve Control is designed to sense when a driver is taking a curve too quickly. In those situations, it rapidly reduces engine torque and can apply four-wheel braking, slowing the vehicle by up to 10 mph in about a second. The technology is designed to be effective on wet or dry pavement, and is expected to be helpful when drivers are entering or exiting freeway ramps with too much speed. As of 2015, a majority of Ford's North American products offer Curve Control. It is currently available on one vehicle in Europe.

## Advanced Front Lighting



Several types of advanced front lighting are now available on Ford Motor Company vehicles, including the following:

**Adaptive Headlights** are designed to use inputs from the steering wheel to turn the headlamps, so the driver can get a better view of the road ahead while negotiating a curve. Adaptive headlights are offered on most new Lincoln products.

**Automatic High Beam Control** helps the driver use the high beam more effectively to improve visibility. The system uses a forward-facing camera to enable or disable the high beam based on detected vehicles ahead and street lights. Automatic High Beam Control is offered on most new Ford vehicles in North America, China and Europe.

**Progressive Beam** is an enhancement of Automatic High Beam Control. The feature extends Automatic High Beam Control by automatically adapting the illumination range according to the distance of traffic ahead while driving with low beam. This feature is available on Ford vehicles in Europe.

**Glare-free headlamps** use a forward-facing camera to enable or disable the high beam based on detected vehicles ahead and street lights. Furthermore, it is designed to provide improved visibility during night-time driving by using LEDs to generate a glare-free spot around vehicles detected ahead. Glare-free headlamps are available on select vehicles in Europe and China.

## Vision for the Future

Today our vehicles offer a wide variety of driver assist features that use technologies such as radar, sonar and cameras to sense the environment and software to interpret it. These technologies are the building blocks for future autonomous vehicles. As discussed above, we are already manufacturing and selling semi-autonomous technologies that use software and sensors to steer into either parallel or perpendicular parking spaces, adjust speed based on traffic flow or apply the brakes if an imminent collision is detected. In addition, vehicles have communication capabilities through our SYNC® system that provide a safe way to stay connected and assist the driver through navigation and emergency services. We are continuing to develop new technologies that allow for more semi-autonomous capabilities to assist the driver.

We are also developing a fully autonomous vehicle for research purposes. The research vehicle builds on our current driver assist and semi-autonomous technologies by adding lidar<sup>1</sup> sensors to generate a real-time 3D map of the vehicle's surrounding environment. We believe fully autonomous driving will ultimately be possible in areas where high-definition mapping is available and where environmental conditions are favorable for the vehicle's sensors.

Connected vehicles – vehicles that can talk with one another and with roadway infrastructure using advanced Wi-Fi signals via dedicated, short-range communications on secured channels – are another important element of our research and vision for the future. Connected vehicles will potentially be able to warn drivers if their vehicle is on a path to collide with another vehicle at an intersection, when a vehicle ahead stops or slows suddenly or when a traffic pattern changes on a busy highway. By reducing collisions, connected vehicles will ease traffic delays, which will potentially save drivers both time and fuel. Gridlock may also be avoided through a network of connected vehicles and infrastructure that processes traffic information and suggests less-congested routes to drivers.

Autonomous and connected vehicles are key elements of our Smart Mobility Plan. In our long-term vision of a future with vehicles that are both autonomous and connected, we believe driving will be safer, traffic less congested and greenhouse gas emissions lower. Admittedly, this vision will likely not be realized for many years. Many technological issues remain, and drivers will need to become comfortable with the idea of giving up some measure of driving control to their vehicle, which will not happen quickly. However, the connected vehicle concept got a significant boost when the U.S. National Highway Traffic Safety Administration (NHTSA) released an advance notice of proposed rulemaking in August 2014 that would potentially create a new Federal Motor Vehicle Safety Standard mandating minimum performance requirements for connected, vehicle-to-vehicle, dedicated short-range communication devices and messages for passenger cars and light trucks.

Ford is very serious about putting autonomous vehicles on the road, and we will continue to take a thoughtful approach to getting there. Our priority is not to make marketing claims or be in a race for the first autonomous car on the road. Our priority is making sure that Ford's autonomous vehicles are accessible for everyone, not just a select few, and that they truly enhance our customers' lives.

## Collaborative Research

In order to progress from current technologies to our long-term vision of connected and autonomous vehicles, we are conducting collaborative research with a variety of public, private and academic entities. Some examples of this research include the following:

- **A Ford Fusion Hybrid automated research vehicle**, which we've been using since 2013,

is enabling us to test current and future sensing systems and driver assist technologies and advance the development of new technologies that can be applied to the company's next generation of vehicles. The research is being conducted jointly with the University of Michigan, Massachusetts Institute of Technology, and State Farm®. We are also working with Stanford University to research and develop solutions to some of the technical challenges surrounding automated driving (see [Mobility section](#) for more information).

- Through the **Crash Avoidance Metrics Partnership (CAMP)**, Ford is leading a group of eight automakers that is working with NHTSA to complete research for a regulation that will require vehicle-to-vehicle communication systems for safety on future vehicles. Ford is also leading a separate consortium that is working with the Federal Highway Administration to research vehicle-to-infrastructure applications for safety, mobility, sustainability and automation.
- **The Vehicle Infrastructure Integration Consortium (VIIC)**, a group of 10 automakers and the U.S. Department of Transportation, is working on the significant practical and policy challenges of connected vehicles, such as security, privacy and the allocation of risk and liability, as well as the funding of infrastructure that will need to be addressed before the vision of a connected vehicle network can become a reality.
- Through the **DRIVE C2X** project in Europe, we have been contributing to the European harmonization and standardization of wireless communication systems and applications. DRIVE C2X is the acronym for “DRIVING implementation and Evaluation of C2X communication technology in Europe.” (C2X refers to “car-to-car and car-to-infrastructure” communication.) This project, co-funded by the European Commission, brings together more than 40 stakeholders, including manufacturers, suppliers, universities and public authorities from all over Europe. As part of this project, field operational tests in a real-world environment were conducted over the course of six to nine months in seven test sites across Europe and revealed the potential for improving traffic safety and efficiency by cooperative systems.
- Ford is one of 29 partners in the **Automated Driving Applications and Technologies (AdaptIVE)** research project. This consortium aims to achieve major breakthroughs leading to more efficient and safer automated driving. Ford is leading a sub-project to develop and test supervised automated driving applications in close-distance scenarios in the low-speed range. As part of this project, Ford engineers are developing a vehicle that creates a map of the parking lot with the use of ultrasonic sensors and radar, which allows navigating into small parking spots.

#### READ MORE:

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Read more about our [Blueprint for Mobility](#).

> [Mobility](#)

- 
1. Lidar is a remote detection system that works on the same principle of radar, but using light from a laser.

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## Product Quality and Safety

- ∨ Customer Satisfaction and Quality

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- ∨ Vehicle Safety and Accident Avoidance
  - Vehicle Safety Highlights
  - Encouraging Safer Driving
  - Accident Avoidance and Driver Assist Technologies
  - > **Occupant Protection Technologies**
  - Post-Crash Response Technologies

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- ∨ Data

# Occupant Protection Technologies

Many factors influence a vehicle’s crash performance, including the design of the vehicle’s structure (i.e., its ability to absorb impact energy) and the use of passive safety equipment such as air bags to supplement safety belts.

Ford’s commitment to advancing the state of the art in vehicle safety includes research and development of technologies that further enhance occupant protection in a wide variety of crash circumstances.

## Ford Technologies

Ford is using more advanced materials than ever, including ultra-high-strength steels, plastics and composites, and aluminum. Increased use of these materials helps us design vehicle structures with enhanced crash energy management while reducing overall vehicle weight – even as we add more features, equipment and safety devices. For example, the all-new Ford F-150 uses aluminum alloys extensively in its body and truck bed. In Europe, the Ford B-MAX uses a significant amount of high-strength steel in its body shell and doors.

Safety belts remain the most important vehicle safety technology available. Beginning with the 2011 Ford Explorer, Ford brought to market the world’s first automotive rear inflatable safety belts, which resulted in several prestigious awards for technological achievement. For example, we were one of 10 companies selected in 2014 to exhibit a technology product at the Smithsonian National Air and Space Museum’s Innovation Festival in Washington, D.C. The rear inflatable safety belts combine the attributes of traditional safety belt and air bag technologies to help further reduce the risk of head, neck and chest injuries for rear seat passengers. In everyday use, the inflatable belts operate like conventional safety belts and are safe and compatible with infant and child safety car and booster seats. Initially, the rear inflatable safety belts were available in North America; they are now also available in other markets.

In 2014 we introduced an all-new inflatable airbag restraint design in the 2015 Ford Mustang. This new design provides knee airbag protection for the front seat passenger while significantly reducing the size and weight of the air bag system. This enables a roomier interior and more comfort while maintaining safety performance. In the initial application of this technology, an inflatable plastic bladder is integrated into the glove box door and provides front passenger knee protection similar to a conventional knee airbag mounted under the instrument panel. Other applications for this unique and patented technology – which allows airbags to be placed in new locations inside the vehicle and provides more freedom to vehicle designers – are being considered.

## Vision for the Future

Ford has a long history of occupant safety research. Even as vehicles begin to include more

On this page:

- ↓ [Ford Technologies](#)
- ↓ [Vision for the Future](#)
- ↓ [Collaborative Research](#)

semi-autonomous technologies, helping to protect the occupants in the event of a crash is of primary importance. To continually enhance occupant protection technologies, we are completing extensive research and advanced engineering in crashworthiness. Some of our key internal research areas are described below. Our major research findings are published in peer-reviewed and other scientific journals.

- **Developing innovative crashworthiness technologies to enhance occupant protection:** We are researching an expanding portfolio of impact scenarios and enhancing safety features for vehicle occupants. As mentioned above, for example, we were the first automaker to introduce rear inflatable safety belt systems, and we also introduced an all-new inflatable airbag restraint design on the 2015 Mustang that enables a roomier interior and more comfort while maintaining safety performance.
- **Developing more advanced anthropomorphic test devices (ATDs):** Ford evaluates ATDs, or crash test dummies, from various aspects (e.g., biofidelity, repeatability, reproducibility, usability and durability). The ultimate goal is to improve ATD biofidelity, thereby advancing the tools used for designing future occupant protection systems.
- **Researching the diverse and changing population of vehicle occupants:** As demographics change, we are researching possible future technology enhancements, in particular for the aging and obese population. We have developed human models that represent elderly individuals to investigate the specific needs of this population segment. And we are addressing the needs of obese passengers through computer modeling of both ATDs and the human body.
- **Conducting field modeling of real-world events:** Ford uses accident data and other field data to identify injury and fatality trends and develop computer models that reproduce real-world outcomes; we then use those models to develop more accurate risk functions. We are also using these models to estimate the effects of demographic trends (e.g., occupant age and weight) and vehicle characteristics (e.g., size and weight) on future traffic safety trends to help guide the design of next-generation occupant protection systems and crash testing methodologies. As an example, Ford's age-dependent risk curve for thoracic injury is presently used by the U.S. National Highway Traffic Safety Administration (NHTSA) to help assign New Car Assessment Program (NCAP) scores.

## Collaborative Research

Ford collaborates with other automotive companies and university researchers on precompetitive safety projects to enhance the safety of the driving experience and develop future technologies.

## U.S. Council for Automotive Research

We collaborate with General Motors and Fiat Chrysler US through the various safety-related councils, working groups and committees of the U.S. Council for Automotive Research (USCAR). These include the Safety Technical Leadership Council (Safety TLC), the Occupant Safety Research Partnership (OSRP) and the Crash Safety Working Group (CSWG).

The OSRP performs research, development, testing and evaluation on ATDs, or crash test dummies. In 2014 and 2015, the group completed evaluation of a new pedestrian leg form and drafted two publications, one on the pedestrian leg form and one on the BioRID-II rear-impact ATD. Also in 2015, the group began evaluating the THOR-M, a new version of a mid-size male ATD developed by NHTSA. Work continues on two new adult side-impact ATDs and an evaluation of the Q-series child ATD is planned. The OSRP evaluations provide a measure of repeatability, reproducibility, biofidelity, usability and durability. The

evaluations are meant to ensure that new ATDs are truly scientific instruments capable of simulating the responses of human occupants in crashes.

The CSWG conducts and directs precompetitive research on crash-related safety issues, with a current focus on issues associated with aspects of advanced, alternate-fueled, energy-efficient vehicles. In 2014, continuing a collaboration with Sandia National Laboratories, the CSWG completed initial tests based on the procedures for live lithium-ion batteries at the cell and module level. The CSWG also initiated a collaboration with the National Renewable Energy Laboratory (NREL) on coupled mechanical-thermal-electrochemical analysis of lithium-ion batteries. The CSWG also evaluated potential new projects to address current computer-aided engineering (CAE) voids in crash simulation of lightweight materials and identified high-strength steel for fracture modeling. For 2015, the group will continue working with Sandia National Laboratories to test live lithium-ion batteries and with NREL to model live lithium-ion batteries for model validation. The group will also continue to define and initiate additional projects for 2015 and explore funding sources for accident/field data analysis and benefit analysis methods projects.

## National Science Foundation's Center for Child Injury Prevention Studies

In 2014, Ford supported research at the National Science Foundation (NSF) Center for Child Injury Prevention Studies (CChIPS) at the Children's Hospital of Philadelphia and University of Pennsylvania. CChIPS is an NSF Industry/University Cooperative Research Center. Participants include seven automotive companies, NHTSA, *Consumer Reports*, automotive suppliers, child-seat manufacturers, insurance companies and a crash-test dummy manufacturer.

In addition to Ford helping fund the work, Ford scientists and engineers helped to select the research projects pursued by CChIPS researchers and have served as mentors for projects that need automakers' vehicle safety expertise. Current projects include, among others, a study to explore ways to provide real-time, in-vehicle, positive reinforcement of appropriate teen driving behaviors; a study to develop a better understanding of pediatric brain injury in automobile crashes; and a study to compare child crash dummies to pediatric volunteer subjects in low-speed crash simulations.

## University Partnerships

Ford collaborates with university partners on a broad array of research projects, including research into advanced safety technologies, and has more than 150 active projects globally. We have expanded activity with our Strategic Alliance partner schools (the University of Michigan, the Massachusetts Institute of Technology, Stanford University and Rheinisch-Westfälische Technische Hochschule (RWTH) Aachen University), along with our Alliance Framework partners (Northwestern, Ohio State and Michigan State) to achieve an all-time record level of 92 new projects in 2014.

In recent years, we have fine-tuned the objectives of our grant-providing University Research Program (URP), moving away from pure exploratory and long-term research and toward highly collaborative projects focused on innovations with more near- and mid-term implementation potential. In 2014, Ford awarded 31 new URP grants to 21 universities around the globe.

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Vehicle Safety and Accident Avoidance

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**Post-Crash Response Technologies**

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# Post-Crash Response Technologies

One method of assisting emergency responders to reach the scene of a vehicle crash quickly is through in-vehicle emergency call systems, also called post-crash notification. These systems can help occupants to summon assistance in an urgent situation.

## Ford Technologies

SYNC<sup>®</sup> is Ford's in-car connectivity system that provides a way for drivers to use cell phones and MP3 players through voice commands while keeping their eyes on the road and hands on the wheel. SYNC-equipped vehicles in the U.S., Europe and other regions of the world come with an occupant communications capability called SYNC 911 Assist (in the U.S.) or Emergency Assistance (in Europe, China, India, Brazil, Taiwan and Australia).

This is a non-subscription call-for-help system. In the event of a severe crash, the ability to directly contact the local emergency operator could be critical, for both the vehicle occupants and first responders. While any cell phone alone could be used in an emergency situation, SYNC can assist in placing a call to an emergency operator and provide GPS location information to help locate the vehicle. SYNC places an emergency call if an airbag is deployed or the fuel pump shutoff is activated as a result of an accident – when a phone is turned on, previously paired via Bluetooth and properly connected to SYNC. SYNC gives the occupants a choice as to whether or not to make the emergency call, and places the call if the occupant does not respond after a short time. Using SYNC's voice capabilities, Emergency Assistance alerts emergency service providers in the correct local language.

In 2014, Ford introduced enhancements to 911 Assist on select vehicles in the U.S. market. Now, when SYNC places a call to an emergency operator, the introduction may include additional emergency information such as: maximum change in velocity during impact, indication of crash type (i.e., front, side, rear or rollover), safety belt usage as detected by the vehicle, whether multiple impacts occurred and whether airbags were deployed. This information can be used to help emergency responders better understand the severity of the incident so that they can dispatch the most appropriate response as needed.

The SOS-Post Crash Alert System<sup>™</sup>, which is standard equipment on most Ford and Lincoln vehicles, is another advance in post-crash safety technology. The SOS-Post Crash Alert System automatically sounds the horn (except in Europe where horn activation is not allowed) and activates the emergency flashers in the event of an air bag deployment or safety belt pre-tensioner activation. In addition, the vehicle doors automatically unlock subsequent to an air bag deployment or safety belt pre-tensioner activation, to aid in rescue. The system is designed to alert passersby and first responders to the vehicle's location.

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# Data

## Product Quality

- > GQRS "Things Gone Wrong" (TGW) (3 months in service) by Region
- > GQRS Customer Satisfaction (3 months in service) by Region
- > Sales Satisfaction with Dealer/Retailer
- > Service Satisfaction with Dealer/Retailer
- > First-time Ford Buyers (Owners who Acquired a New Vehicle for the First Time)
- > Owner Loyalty (Customers Disposing of a Ford Motor Company Product and Acquiring Another)

## Vehicle Safety

- > Percent of Nameplates Achieving 4-star or Better NCAP Overall Vehicle Score (OVS)
- > Percent of Nameplates Achieving 5-star NCAP Overall Vehicle Score (OVS)
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## Product Quality and Safety

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# Data: Product Quality

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- A. [↓ GQRS "Things Gone Wrong" \(TGW\) \(3 months in service\) by Region](#)
- B. [↓ GQRS Customer Satisfaction \(3 months in service\) by Region](#)
- C. [↓ Sales Satisfaction with Dealer/Retailer](#)
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- E. [↓ First-time Ford Buyers \(Owners who Acquired a New Vehicle for the First Time\)](#)
- F. [↓ Owner Loyalty \(Customers Disposing of a Ford Motor Company Product and Acquiring Another\)](#)

## A. GQRS "Things Gone Wrong" (TGW) (3 months in service) by Region

Total "things gone wrong" per 1,000 vehicles

	2009	2010	2011	2012	2013	2014
North America	1,430	1,358	1,449	1,514	1,650	1,392
South America	2,258	2,126	1,510	1,416	1,724	1,472
Europe	2,224	1,827	1,747	1,573	1,302	1,302
Asia Pacific	2,266	1,979	1,100	860	941	917
Middle East & Africa	1,977	1,814	1,122	1,535	1,311	1,046

Third party rating

Data notes and analysis:

We no longer report overall quality data for all global regions combined. Quality performance is dependent on regional operations. Therefore we will only report regional quality data moving forward. "Things gone wrong" data are based on model years.

Also see:

[> Customer Satisfaction and Quality](#)

## B. GQRS Customer Satisfaction (3 months in service) by Region

Percent satisfied

	2009	2010	2011	2012	2013	2014
North America	78	80	79	79	78	79
South America	68	66	66	65	65	68
Europe	58	59	62	68	71	73
Asia Pacific	48	48	59	67	68	69
Middle East & Africa	55	56	54	69	63	62

 Third party rating

Data notes and analysis:

We no longer report overall quality data for all global regions combined. Quality performance is dependent on regional operations. Therefore we will only report regional quality data moving forward. Customer satisfaction data are based on model years.

Also see:

> [Customer Satisfaction and Quality](#)

## C. Sales Satisfaction with Dealer/Retailer

Net promoter score

	2009	2010	2011	2012	2013	2014
Ford Brand U.S.	82.0	84.0	85.0	87.0	88.0	87.0
South America	75.0	78.0	80.0	73.0	74.0	77.0
Europe <sup>1</sup>	77.0	82.0	82.0	86.5	87.0	88.0
Asia Pacific <sup>2</sup>	NA	52.0	66.0	69.0	75.0	84.0
Middle East & Africa <sup>3</sup>	NA	NA	72.0	51.0	62.0	64.0

Data notes and analysis:

NA = Not available.

Sales satisfaction with Dealer/Retailer data are based on calendar years.

1. European sales and service satisfaction with dealers and retailers are net promoter scores based on 22 European markets, including Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, the Netherlands, Norway, Poland, Portugal, Romania, Russian Federation, Spain, Sweden, Switzerland, Turkey and the United Kingdom.
2. We initiated the sales satisfaction with dealer/retailer in our Asia Pacific Africa region in 2010. From 2010–2013 this data includes 10 Asia Pacific markets (Australia, China CAF, India, Indonesia, Japan, New Zealand, Philippines, Taiwan, Thailand, and Vietnam) and South Africa. In 2014, South Africa data was removed as part of the new regional organization. Beginning in 2015, the Asia Pacific data will include the 10 Asia Pacific markets plus Korea, Malaysia, and 18 emerging Asia Pacific markets.
3. For 2011–2013, Middle East sales and service satisfaction data is based on the following countries: Saudi Arabia, Kuwait, UAE, Oman, Bahrain, and Qatar. In 2014, we added, Jordan, Iraq, and Lebanon to the survey.

Also see:

>

## D. Service Satisfaction with Dealer/Retailer

Net promoter score

	2009	2010	2011	2012	2013	2014
Ford Brand U.S.	74.0	75.0	75.0	78.0	77.0	75.0
South America	63.0	67.0	71.0	73.0	60.0	59.0
Europe <sup>1</sup>	67.0	69.0	64.0	71.5	73.0	75.0
Asia Pacific <sup>2</sup>	NA	35.0	56.0	63.0	72.0	80.0
Middle East & Africa <sup>3</sup>	NA	NA	40.0	21.0	31.0	32.0

Data notes and analysis:

NA = Not available.

Sales satisfaction with Dealer/Retailer data are based on calendar years.

1. European sales and service satisfaction with dealers and retailers are net promoter scores based on 22 European markets, including Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, the Netherlands, Norway, Poland, Portugal, Romania, Russian Federation, Spain, Sweden, Switzerland, Turkey and the United Kingdom.
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Also see:

> [Customer Satisfaction and Quality](#)

## E. First-time Ford Buyers (Owners who Acquired a New Vehicle for the First Time)

Percent of first-time buyers

	2009	2010	2011	2012	2013	2014
Ford Motor Company U.S.	8.7 <sup>1</sup>	8.4	10.1	10.6	10.8	11.1
Ford Motor Company Europe (UK, Germany, Italy, France, Spain)	10.0	8.0	9.0	7.0	7.0	8.0

Data notes and analysis:

1. We have corrected the 2009 first time buyer number to correct an error.

Also see:

[> Customer Satisfaction and Quality](#)

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## F. Owner Loyalty (Customers Disposing of a Ford Motor Company Product and Acquiring Another)

Percent loyal to corporation

	2009	2010	2011	2012	2013	<b>2014</b>
Ford Motor Company U.S.	42.1	49.7	48.6	47.7	49.1	<b>50.4</b>
Ford Motor Company Europe (UK, Germany, Italy, France, Spain)	49.0	45.0	51.0	52.0	51.0	<b>54.0</b>

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Also see:

[> Customer Satisfaction and Quality](#)

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## Product Quality and Safety

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  - > **Vehicle Safety**

# Data: Vehicle Safety

Data on this page:

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- B. ↓ [Percent of Nameplates Achieving 5-star NCAP Overall Vehicle Score \(OVS\)](#)
- C. ↓ [Percent of Nameplates Achieving IIHS Top Safety Pick by Manufacturer](#)
- D. ↓ [Euro NCAP \(2014 Ratings\)](#)
- E. ↓ [U.S. Safety Recalls](#)

## A. Percent of Nameplates Achieving 4-star or Better NCAP Overall Vehicle Score (OVS)

Data are for the model year noted.

Percent of Ford Motor Company vehicles tested by model year

	2011	2012	2013	2014	<b>2015</b>
Ford	17	60	95	100	<b>100</b>
Toyota	42	54	100	100	<b>100</b>
GM	95	82	89	88	<b>87</b>

Third party rated ([NHTSA](#))

Data notes and analysis:

Beginning with the 2011 model year the National Highway Traffic Safety Administration (NHTSA) significantly changed its New Car Assessment Program (NCAP) and added a new metric, the Overall Vehicle Score (OVS), a calculation based on data from frontal crash, side crash, and rollover evaluations. We are simplifying our metrics and reporting NHTSA's OVS. For detailed information on the NCAP system, see [www.safercar.gov](http://www.safercar.gov), and in particular [www.safercar.gov/staticfiles/toolkit/pdfs/faq.pdf](http://www.safercar.gov/staticfiles/toolkit/pdfs/faq.pdf) (pdf, 212kb).

Also see:

> [Vehicle Safety](#)

## B. Percent of Nameplates Achieving 5-star NCAP Overall Vehicle Score (OVS)

Data are for the model year noted.

	2011	2012	2013	2014	2015
Ford	0	0	32	41	65
Toyota	0	0	33	60	36
GM	11	25	43	40	62

 Third party rated ([NHTSA](#))

Data notes and analysis:

Beginning with the 2011 model year the National Highway Traffic Safety Administration (NHTSA) significantly changed its New Car Assessment Program (NCAP) and added a new metric, the Overall Vehicle Score (OVS), a calculation based on data from frontal crash, side crash, and rollover evaluations. We are simplifying our metrics and reporting NHTSA’s OVS. For detailed information on the NCAP system, see [www.safercar.gov](http://www.safercar.gov), and in particular [www.safercar.gov/staticfiles/toolkit/pdfs/faq.pdf](http://www.safercar.gov/staticfiles/toolkit/pdfs/faq.pdf) (pdf, 212kb).

Also see:

> [Vehicle Safety](#)

### C. Percent of Nameplates Achieving IIHS Top Safety Pick by Manufacturer

Due to continually changing Public Domain environment, the data previously provided highlighting IIHS ratings will no longer be included in this report. As these test programs and their related rating schemes continue to evolve, it is becoming increasingly more difficult to accurately compare current production vehicles to the previous model year within the IIHS test program. For detailed information on the IIHS’s testing procedures, see <http://www.iihs.org/ratings/>.

### D. Euro NCAP (2014 Ratings)

Overall percentage

	Industry Low	Industry High	Industry Average	Ford results
Small MPV (Ford Tourneo Courier)	57	79	69	77
Large Family Car (Ford Mondeo)	78	83	81	78

 Third party rated ([Euro NCAP](#))

Data notes and analysis:

Euro NCAP combines all assessed criteria into an overall “fulfillment percentage,” ranging from 0 percent to 100 percent (overall threshold). Star ratings are dependent on the fulfillment percentage or the star level threshold of each individual assessment box (adult, child, pedestrian and safety assist). The worst-case threshold determines the overall rating. In 2014 the following thresholds were required for a five-star rating: Adult 80 percent, child 75 percent, pedestrian 60 percent, safety assist 65 percent

and overall 75 percent. In addition to the star ratings, seven Ford vehicles have received the “Euro NCAP Advanced Award” for new technologies so far. For more information, visit [www.euroncap.com](http://www.euroncap.com).

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Also see:

> [Vehicle Safety](#)

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## E. U.S. Safety Recalls

	2009	2010	2011	2012	2013	2014
Number of safety recalls	8	7	13	24	16	40
Number of units	4,522,000	551,000	3,339,000	1,399,000	1,188,000	4,866,770

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 Reported to regulatory authorities ([NHTSA](#))

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Data notes and analysis:

The increase in safety recalls from 2013 to 2014 was due in part to the U.S. National Highway Traffic Safety Administration (NHTSA) expanding its definition of safety defects, which has led to the highest number of safety recalls in the U.S. across all auto manufacturers.

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Also see:

> [Vehicle Safety](#)

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## Climate Change and Environment

As we develop new approaches to mobility that will reduce the carbon footprint and environmental impacts of transportation in the future, we are also evolving our vehicles and production processes to deliver benefits to our environment and climate today.

### Climate Change and Environment

- ▼ Climate Change
- ▼ Water
- ▼ Greening Our Products
- ▼ Greening Our Operations
- ▼ Data

Spotlight: Reinventing the Ford F-150

Spotlight: Ford Driving Skills for Life / Eco-Driving



### Our Products

We are working to reduce the environmental impacts of our vehicles across their full life cycle, including improving fuel-efficiency and emissions and using more sustainable materials.

> [Greening Our Products](#)



### Our Operations

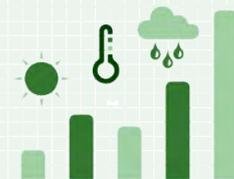
We have a rigorous and holistic approach to reducing the overall environmental impacts of our manufacturing facilities.

> [Greening Our Operations](#)



### Water

At Ford, we see water as far more than an environmental concern. We see it as a basic human right. Through our water strategy, we seek to uphold and respect that right.



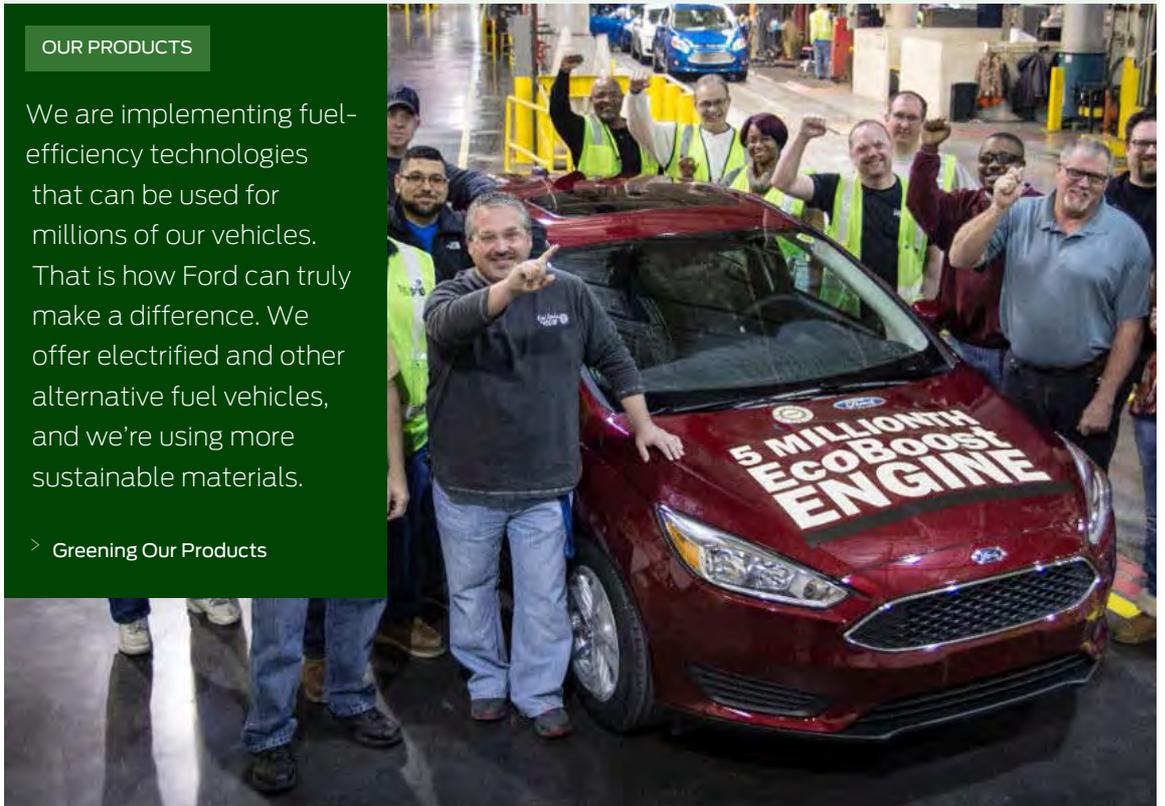
### Climate Change

We recognize the risks and opportunities climate change poses and are committed to doing our share to prevent or reduce the potential for environmental, economic and social harm.

OUR PRODUCTS

We are implementing fuel-efficiency technologies that can be used for millions of our vehicles. That is how Ford can truly make a difference. We offer electrified and other alternative fuel vehicles, and we're using more sustainable materials.

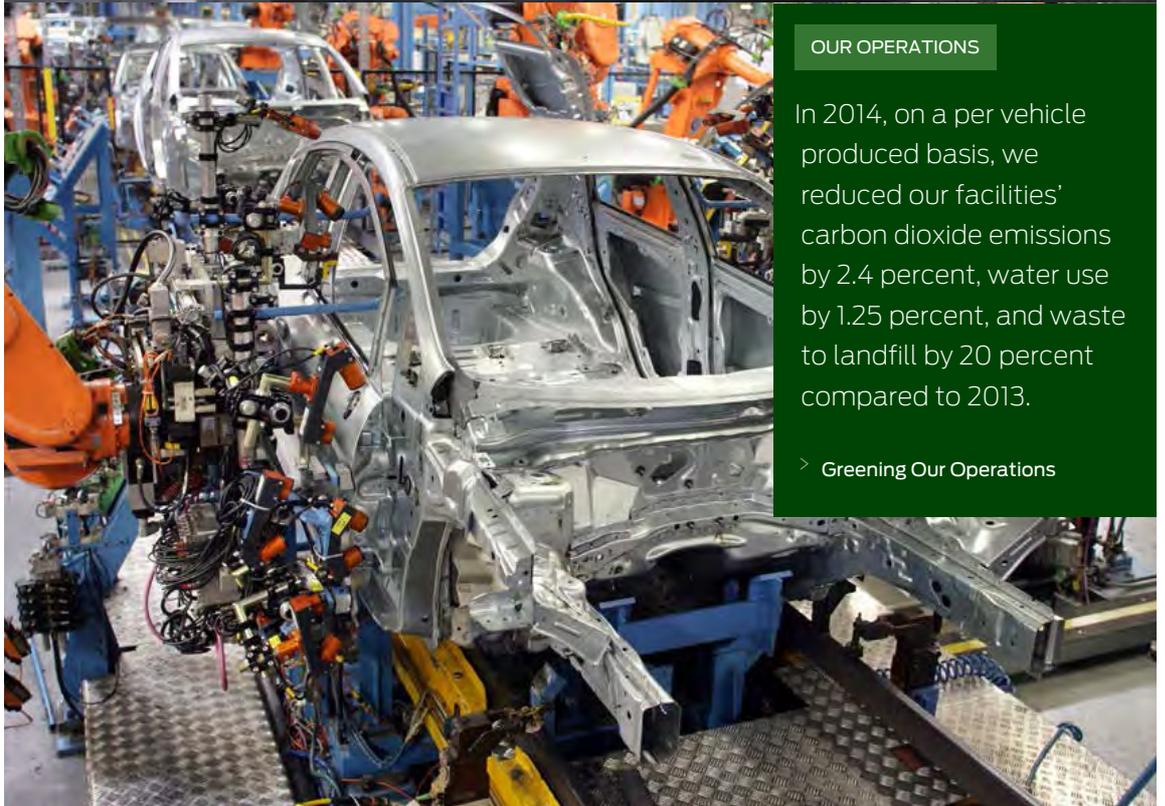
> Greening Our Products



OUR OPERATIONS

In 2014, on a per vehicle produced basis, we reduced our facilities' carbon dioxide emissions by 2.4 percent, water use by 1.25 percent, and waste to landfill by 20 percent compared to 2013.

> Greening Our Operations



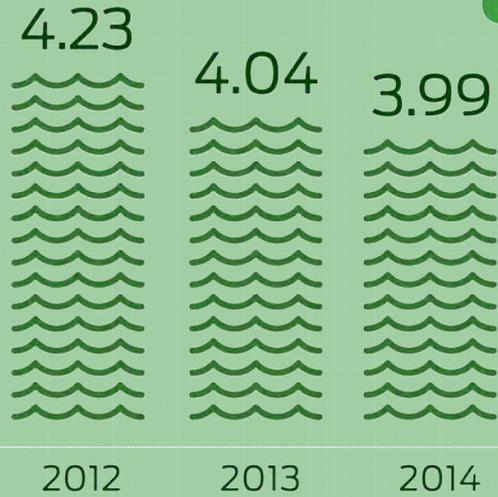
WATER

Our water strategy is designed to effect substantial, sustainable and measureable positive impacts within our own facilities, across our supply chain and in our regions of operation, while prioritizing

Global Water Use per Vehicle Produced (cubic meters)

facilities in water-stressed regions.

> Water



From 2010 to 2014, we reduced manufacturing CO<sub>2</sub> emissions per vehicle produced by more than **22 percent.**

CLIMATE CHANGE

We are on course to meet our science-based climate goal: doing our part to stabilize carbon dioxide (CO<sub>2</sub>) emissions in the atmosphere at 450 ppm, a level many scientists agree will forestall the worst projected impacts of climate change.

> Climate Change

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- 
- Spotlight: Reinventing the Ford F-150
- 
- Spotlight: Ford Driving Skills for Life / Eco-Driving

# Climate Change

Climate change is caused by the increase of heat-trapping (greenhouse) gases, such as carbon dioxide (CO<sub>2</sub>), in the Earth's atmosphere.

The increase in atmospheric concentrations of these greenhouse gases (GHGs) is primarily caused by burning fossil fuels, including gasoline and diesel used to power automobiles. Globally, light-duty trucks and passenger vehicles contributed about 12 percent of all fossil fuel CO<sub>2</sub> emissions in 2011.<sup>1</sup> Ford recognizes the [risks and opportunities climate change poses](#) and we are committed to doing our share to prevent or reduce the potential for environmental, economic and social harm due to climate change.

- On this page:
- ↓ [Our Goals](#)
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*Ford recognizes the risks and opportunities climate change poses.*

## A Science-Based Strategy

To make good on this commitment, we have analyzed what “doing our share” means according to the science of climate change. We have set emission-reduction goals for our products by region and manufacturing operations based on stabilizing the atmospheric concentration of CO<sub>2</sub> at 450 parts per million (ppm), the level that many scientists, businesses and government agencies believe may avoid the most serious effects of climate change.<sup>2</sup> We refer to our strategy as “science-based” because, while our goal takes policy and regulations into account, it was developed based on scientific consensus about the process of climate change.

We also work cooperatively with the public and private sectors to advance climate change solutions. We are taking a holistic approach to the issue, recognizing that it affects all parts of our business and is interconnected with other important issues, from water availability and energy security to human rights. We believe our commitment to addressing the climate change issue in a comprehensive and strategic way is one of the factors that has helped to make our company more successful while also making it more resilient and adaptable.

*Ford takes a holistic approach to the issue of climate change.*

Also see:

- > [Developing Our Stabilization-Based Climate Change Strategy and CO<sub>2</sub> Reduction Targets](#)

## Our Goals

Our stabilization-based commitment includes the following goals:

- Across our global portfolio of products, we will improve fuel economy and introduce alternative-fuel vehicles to reduce GHG emissions consistent with doing our part for climate stabilization – even taking into account sales growth. We translate this goal

into specific CO<sub>2</sub> reductions for each of our regional vehicle fleets.

- For each of our new or significantly refreshed vehicles, we offer a popular powertrain model with leading fuel economy.
- We will reduce our facility CO<sub>2</sub> emissions by 30 percent from 2010 to 2025 on a per-vehicle basis and reduce average energy consumed per vehicle by 25 percent from 2011 to 2016 globally.

Also see:

> [Sustainable Technologies and Alternative Fuels Plan](#)

## Our Progress

We continue making progress toward our CO<sub>2</sub> reduction commitments, despite challenges in containing the cost of fuel-efficiency technologies and volatility in consumer demand for more fuel-efficient vehicles. We have reshaped our global product portfolio over the last seven years, introducing smaller vehicles, downsized engine displacements and alternate-fuel vehicles, including a suite of electric vehicles. And by adding both incremental and step-change technologies, we have improved fuel economy across a range of popular vehicles. We also continue to invest in energy-efficiency improvements at our facilities worldwide and to assess carbon emissions in our supply chain through multi-stakeholder projects.

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*We have reshaped our global product portfolio over the last seven years.*

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Our recent progress includes the following:

- In the U.S., we increased our combined car and truck fleet-average fuel economy by 2 percent in 2014, compared with 2013.<sup>3</sup>
- In Europe, we reduced the average CO<sub>2</sub> emissions of our car fleet by approximately 18 percent between the 2006 and 2014 calendar years.
- We reduced CO<sub>2</sub> emissions from our global operations in 2014 by 2.4 percent per vehicle produced, compared to 2013.
- We have sold 5 million vehicles with fuel-efficient, EcoBoost® engine technology across our global markets.
- As of late April 2015, Ford plug-in electric vehicles (the Focus Electric battery electric vehicle (BEV) and Fusion Energi and C-MAX Energi plug-in electric vehicles (PHEVs)) have been driven approximately 361 million electricity-powered miles. These “all-electric” miles have resulted in a reduction of approximately 27 million kg of CO<sub>2</sub> compared to gasoline-powered driving. Ford PHEV and BEV owners drive an additional 800,000 all-electric miles nearly every day.

Also see:

> [Vehicle Fuel Efficiency and CO<sub>2</sub> Emissions Progress and Performance](#)

> [Operational Energy Use and Greenhouse Gas Emissions](#)

## Supporting Climate Change Policies

Neither Ford nor the auto industry can achieve climate stabilization alone. Reducing emissions by the amount required calls for an integrated approach – a partnership across all sectors and of all stakeholders, including the automotive industry, the fuel and utilities industries, governments and consumers. It can only be achieved by significantly and continuously reducing GHG emissions over a period of decades in all sectors of the economy as well as across the globe. In the transportation sector, this means improving vehicle fuel economy, developing lower-carbon fuels and working with the government on complementary measures to encourage consumers to purchase more fuel-efficient

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*Reducing emissions by the amount required calls for an integrated approach involving all sectors and stakeholders.*

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vehicles and vehicles that can operate with lower-carbon fuels. We are committed to working with all key stakeholders to create policies that further promote the development and availability of lower-carbon fuels and other complementary measures.

We are committed to advocating for effective and appropriate climate change policy. We are promoting comprehensive market-based policy approaches that will provide a coherent framework for GHG emission reductions, so that companies like ours can move forward in transforming their businesses with a clear understanding of their obligations. However, if there is a mismatch between available fuels, vehicle offerings and consumer choices, climate stabilization goals will not be met. For example, in recent years, gasoline prices have gone down significantly. As a result of this development, purchases of more fuel-efficient vehicles and of alternative fuel and powertrain vehicles, have also gone down. This is making it more difficult to reduce overall GHG emissions from passenger vehicles, meet our own climate stabilization goals, and meet fuel economy and vehicle CO<sub>2</sub> regulations.

Also see:

> [Climate Change and Fuel Economy](#)

#### READ MORE:

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*We have a comprehensive, science based strategy for doing our part to reduce climate change.*

> [Ford's Climate Change Strategy](#)

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*We are implementing a suite of fuel efficiency technologies as well as alternative fuel and powertrain vehicles.*

> [Sustainable Technologies and Alternative Fuels Plan](#)

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*We are making progress on our vehicle CO<sub>2</sub> reduction goals in all of our regions.*

> [Vehicle Fuel Efficiency and CO<sub>2</sub> Emissions Progress and Performance](#)

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1. International Energy Agency (IEA), *Energy Technology Perspectives 2014* (Paris, France: IEA, 2014). ETP2014 transport summary and scenario summary online data.
  2. The current atmospheric concentration of CO<sub>2</sub> is approximately 400 ppm [www.CO2now.org](http://www.CO2now.org) accessed 3-6-15)
  3. The average fuel economy of our car fleet and our truck fleet both remained unchanged compared to 2013. However, our *combined* corporate average fuel economy improved due to increased customer demand for cars versus trucks.

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# Ford's Greenhouse Gas Footprint

We are working to understand the greenhouse gas (GHG) footprint of our operations and products over their total life cycle – from raw materials extraction to manufacturing to product use and disposal at end of life. We use this broad understanding of our GHG footprint across our value chain to identify and prioritize the key areas on which to focus our GHG emissions reduction efforts.

We are in the process of assessing many elements of our GHG footprint (see Figure 2 below). We have a good understanding of GHG emissions associated with our facilities, including direct emissions from our electricity production and indirect emissions from purchased electricity, steam and heat. We also have estimates of the emissions associated with the “use” or driving phase of our products, which is by far the largest contributor to our overall GHG footprint.

Figure 1 below provides our calculation of GHG emissions from our facilities and from the use of all Ford vehicles on the road in 2012, including new sales and the legacy fleet.<sup>1</sup> Figure 2 provides our current assessment of the relative contribution of these and other categories of emissions to our GHG footprint and information on our efforts to reduce or influence GHG emissions at these different stages across our value chain.

**FIGURE 1: 2012 GHG Emissions from Ford's Operations and Ford Vehicles on the Road**

	<i>Million tonnes</i>
	2012
Ford Facilities	4.8
New Ford Vehicles	25
All Other Ford Vehicles	311

**FIGURE 2: GHG Emissions across Our Value Stages<sup>2</sup>**

**Logistics/Transportation (upstream/downstream)**  
Scope 3 Indirect




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<p><b>Emissions Category<sup>3</sup></b></p> <p>Transportation of parts and finished vehicles</p>	<p><b>Ford's Efforts to Reduce or Influence Emissions</b></p> <p>Although logistics accounts for a relatively small percentage of our vehicles' total life cycle emissions, we are working hard to</p>
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## Contribution to Ford's GHG Footprint

 Small

maximize the efficiency of these operations to reduce their environmental impact. We are also measuring GHG emissions from logistics as part of our efforts to understand and reduce these emissions.

Also see:

> [Logistics Operations](#)

## Supplier Parts Manufacturing (downstream)

Scope 3 Indirect



### Emissions Category <sup>3</sup>

Supply chain (purchased goods and services, capital goods)

### Ford's Efforts to Reduce or Influence Emissions

We are working to understand the GHG emissions from our key suppliers' facilities. And, we are continuing to expand our approach to enhancing supplier environmental performance.

Also see:

> [Environmental Sustainability in Our Supply Chain](#)

## Contribution to Ford's GHG Footprint

 Under investigation

## Ford Manufacturing

Scope 1 Direct



### Emissions Category <sup>3</sup>

Direct electricity production, direct consumption of fossil fuels for non-electricity applications

### Ford's Efforts to Reduce or Influence Emissions

We are taking many steps to reduce our energy use. We are also using on-site renewable energy sources at some facilities to reduce our direct carbon emissions.

Also see:

> [Operational Energy Use and Greenhouse Gas Emissions](#)

> [Renewable Energy](#)

## Contribution to Ford's GHG Footprint

 Small

## Ford Manufacturing

Scope 2 Indirect



### Emissions Category <sup>3</sup>

Purchased electricity and heat

### Ford's Efforts to Reduce or Influence Emissions

We are taking many steps to reduce our energy use.

Also see:

> [Operational Energy Use and Greenhouse Gas Emissions](#)

## Contribution to Ford's GHG Footprint

 Small

## Ford Manufacturing

Scope 3 Indirect



### Emissions Category<sup>3</sup>

Employee travel and commuting

### Contribution to Ford's GHG Footprint

Small

### Ford's Efforts to Reduce or Influence Emissions

Though this is a very small element in our overall GHG footprint, we are reducing employee travel and commuting emissions in a number of ways, including allowing telecommuting, encouraging virtual meetings, and facilitating employees' use of electric vehicles by offering on-site vehicle charging at many facilities.



## Sales and Service

Scope 3 Indirect



### Emissions Category<sup>3</sup>

Dealerships

### Contribution to Ford's GHG Footprint

Not currently measured

### Ford's Efforts to Reduce or Influence Emissions

We are working with our dealers to reduce the GHG emissions of their operations, including funding energy efficiency upgrades and piloting on-site renewable energy.

Also see:

> [Dealership Energy Efficiency](#)



## Product Use

Scope 3 Indirect



### Emissions Category<sup>3</sup>

Vehicle use phase

### Contribution to Ford's GHG Footprint<sup>4</sup>

Large

### Ford's Efforts to Reduce or Influence Emissions

We have a comprehensive plan for reducing the GHG emissions from our vehicles and are making progress on our climate stabilization goals and vehicle GHG emissions. We also have programs to help consumers make more fuel-efficient driving choices.

Also see:

> [Sustainable Technologies and Alternative Fuels Plan](#)

> [Climate Change](#)

> [Vehicle Fuel Efficiency and CO<sub>2</sub> Emissions Progress and Performance](#)

> [Driver](#)



## End of Life

Scope 3 Indirect



### Emissions Category<sup>3</sup>

End of life product disposal

### Ford's Efforts to Reduce or Influence Emissions

We are working to improve the end-of-life management of our vehicles, including increasing their recyclability.

## Contribution to Ford's GHG Footprint

Also see:

> [End of Life](#)

 Small

We are working to gather the information we need to provide an accurate and complete estimate of our total GHG footprint, especially the data for many of the [Scope 3 emissions categories](#) such as emissions from our supply chain, the transportation of parts and finished products, and our dealerships. We prefer to have a high level of confidence about measurements and estimates of these different categories before reporting values. However, we are continually working to improve this understanding and will continue to provide updates on our GHG footprint through this report and other sources.

### READ MORE:

- > [How We Are Assessing Our GHG Footprint](#)
- > [Life Cycle Assessment](#)
- > [Environmental Sustainability in Our Supply Chain](#)

1. This calculation differs from the Scope 3 definition of “use of sold products” in the World Resource Institute’s and World Business Council for Sustainable Development’s GHG Protocol method for accounting and reporting GHG emissions from organizations, which estimates the life cycle emissions of all products sold during the reporting year.
2. In Figure 2, *Scope* refers to the World Resource Institute’s and World Business Council for Sustainable Development’s GHG Protocol method for accounting and reporting GHG emissions from organizations. Please see the [How We Are Assessing Our GHG Footprint](#) section for definitions of these scopes. Or for more details see [the GHG Protocol website](#) (pdf, 5.9Mb).
3. The scopes and emissions categories in this graphic are based on the GHG Protocol. That protocol includes more emissions categories than we present here; we have chosen to focus on the categories that are most significant to our operations. For a complete list of the GHG emissions categories please see the GHG Protocol Scope 2 guidance [revised](#) (pdf, 3.5Mb) and [final](#) (pdf, 3.5Mb) and [Scope 3 guidance](#) (pdf, 5.9Mb).
4. GHG emissions during the “use” phase of our vehicles are actually contained within the GHG footprints of millions of our customers around the world, who make their own individual decisions regarding not only what vehicles to purchase or lease, but also how often, how far and how aggressively to drive those vehicles. Although these day-to-day customer decisions are not within our control, we recognize that our vehicles’ fuel efficiency and other GHG-related characteristics are significant factors in determining our customers’ aggregate GHG emissions from the use of our products. Accordingly, we include this “use” phase as part of our GHG footprint for purposes of this report.

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# How We Are Assessing Our GHG Footprint

Developing a complete and accurate carbon footprint of any organization is challenging. It requires making difficult decisions about which emissions the organization is responsible for or can influence and which emissions fall outside these boundaries. Then, accurately measuring or estimating emissions from the different sources included can be even more complex.

In the most limited view, we could look only at the emissions generated by our own facilities, but we recognize this would not accurately reflect our overall footprint. A more extensive and accurate view of our greenhouse gas (GHG) footprint incorporates emissions across all stages of our value chain, including emissions from our own operations, from the vehicles we produce over their total driving lifetimes, from the operations of suppliers throughout our supply chain to extract, process and transport materials and parts for our products, and from the disposal of our products at the end of their useful lives. Some of these emissions we can control directly – for example, the emissions from our own operations. However, most we do not control and cannot measure directly.

Our ability to influence and even measure the GHG emissions directly and indirectly caused by our operations and products decreases the further up and down our value chain we look. Even the GHG emissions of our own operations and products are not completely within our control. For example, we cannot specify the fuels burned to generate the electricity we purchase, which adds a layer of complexity to measuring and reducing our operational GHG emissions. Similarly, while we can influence the GHG emissions of our vehicles by using more fuel-efficient technologies and offering alternatively powered vehicles, such as electric vehicles, we can't control which vehicles people buy or how people drive, which greatly impacts actual fuel economy and use phase GHG emissions. Moving further up or down our value chain complicates things even more. For example, we have limited ability to track precisely or influence the GHG emissions of our direct suppliers, and this ability decreases throughout the sub-tiers of our supply chain.

We use two primary tools to understand our GHG footprint across our value chain: life cycle analysis and the “scope-based” GHG Protocol developed by the World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD). Life cycle analysis helps us to assess the GHG emissions of our products across their life cycle from “cradle to grave” – i.e., from raw materials extraction to supplier production to our own manufacturing, product use and end-of-life disposal. The WRI/WBCSD greenhouse gas protocol focuses on total emissions from the different value chain stages or activities required to make, use and dispose of our products for our company as a whole. WRI/WBCSD defines emissions based on “scopes” or categories of direct and indirect emissions from different points along an organizations value chain (see definitions below).

These two different approaches help us to identify where we have the greatest GHG

emissions impacts, which in turn helps us to develop and prioritize our efforts to reduce those GHG emissions.

GHG Emissions Scopes Defined		
Scope 1	Scope 2	Scope 3
<ul style="list-style-type: none"> <li>• Direct GHG emissions from sources that are owned or controlled by the entity</li> <li>• Can include emissions from fossil fuels burned on-site, emissions from entity-owned or entity-leased vehicles, and other direct sources</li> </ul>	<ul style="list-style-type: none"> <li>• Indirect GHG emissions resulting from the generation of electricity, heating and cooling, or steam generated offsite but purchased by the entity</li> </ul>	<ul style="list-style-type: none"> <li>• Indirect GHG emissions from sources not owned or directly controlled by the entity but related to the entity's activities</li> <li>• Emissions generated to produce the goods and services we purchase, emissions from transporting unfinished parts and finished products, emissions generated when our customers use our products, employee travel and commuting, and end-of-life treatment of our products</li> </ul>

Carbon dioxide (CO<sub>2</sub>) makes up the vast majority of GHG emissions produced by our operations and products across our total value chain. However, we are also working to understand and reduce non-CO<sub>2</sub> greenhouse gas emissions from our products.

**READ MORE:**

- |   |   |   |
|---|---|---|
| <p><i>Our efforts to understand GHG emissions from our supply chain and logistics operations</i></p> <p>&gt; <a href="#">Environmental Sustainability in Our Supply Chain</a></p> | <p><i>How we are using life cycle assessment tools to understand and reduce our environmental impacts</i></p> <p>&gt; <a href="#">Life Cycle Assessment</a></p> | <p>&gt; <a href="#">Beyond CO<sub>2</sub></a></p> <p>&gt; <a href="#">Assessing the Environmental Impacts of Our Suppliers</a></p> <p>&gt; <a href="#">Logistics Operations</a></p> |
|---|---|---|

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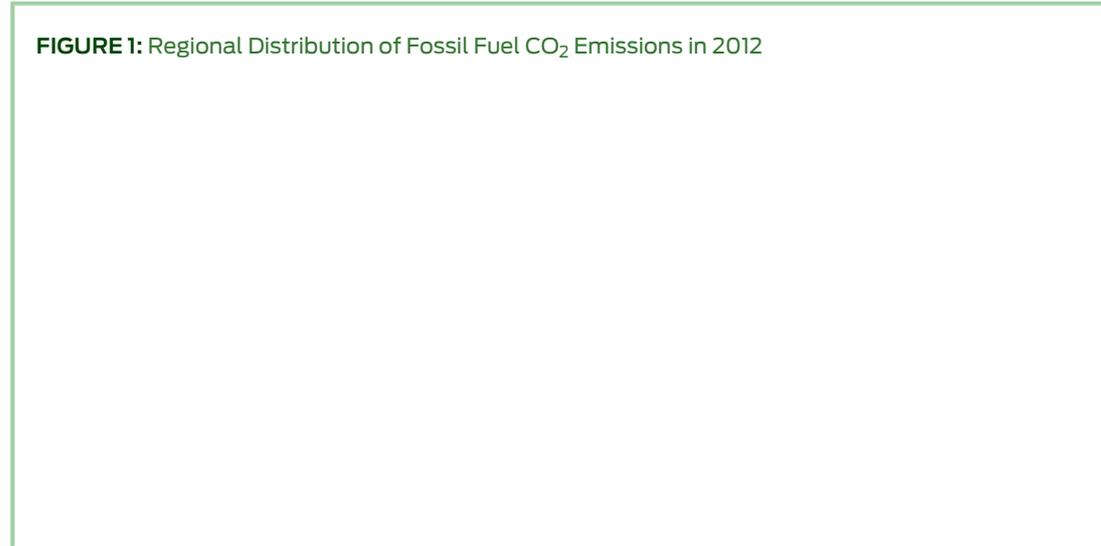
# Putting Our Greenhouse Gas Footprint in Perspective: a Cross-Industry Look

Cars and trucks are a significant contributor to climate change. The transportation sector overall – including emissions from cars and light-duty trucks, larger trucks and buses, airplanes, ships, rail transport and other modes of transportation – contributed approximately 22 percent of greenhouse gas (GHG) emissions globally in 2011.<sup>1</sup> Passenger cars and light-duty trucks, Ford's primary products, made up about half<sup>2</sup> of the 2011 total transportation GHG emissions on a well-to-wheels basis.

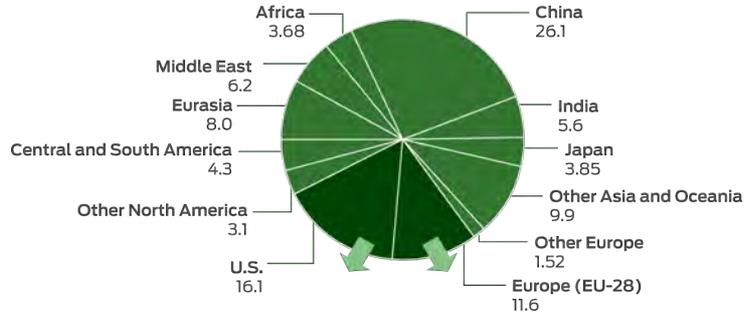
Globally, well-to-wheels emissions from cars and light-duty trucks comprise about 12 percent<sup>3</sup> of all fossil fuel carbon dioxide (CO<sub>2</sub>) emissions. This includes vehicles from all manufacturers. Ford's vehicles, including both new cars and existing vehicles on the road (see Figure 1), emit about 1 percent of all fossil fuel CO<sub>2</sub> emissions.

To put Ford's GHG emissions and the emissions of the auto industry overall in perspective, it is helpful to compare to other industries. Electricity generation and heating contributed approximately 42 percent of total global CO<sub>2</sub> emissions in 2011,<sup>1</sup> significantly more than all transportation.<sup>4</sup>

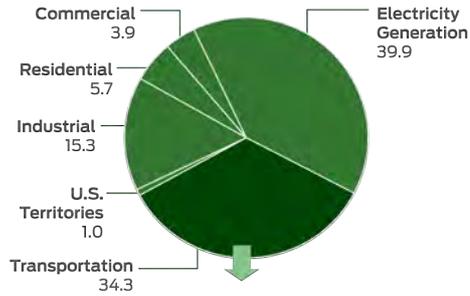
Figure 1 below provides a breakdown of estimated 2011 fossil fuel CO<sub>2</sub> emissions by region. For the U.S. and Europe (EU-27), the emissions are further broken down by sector and by mode in the transportation sector. The data were taken from reports published by the International Energy Agency, the European Environment Agency and the U.S. Environmental Protection Agency.



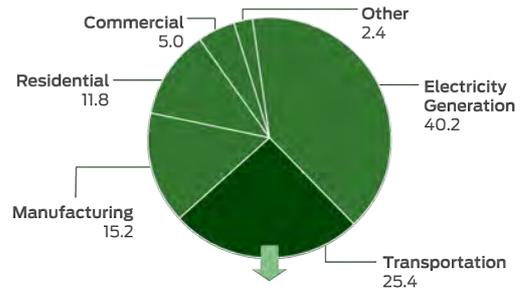
## Global CO<sub>2</sub> Emissions



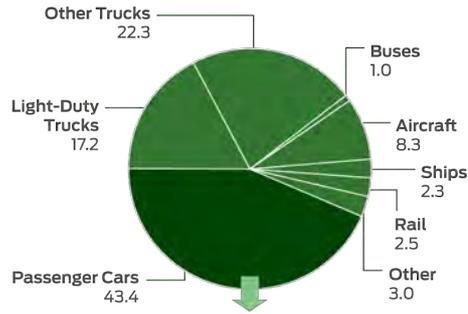
### U.S. by Sector



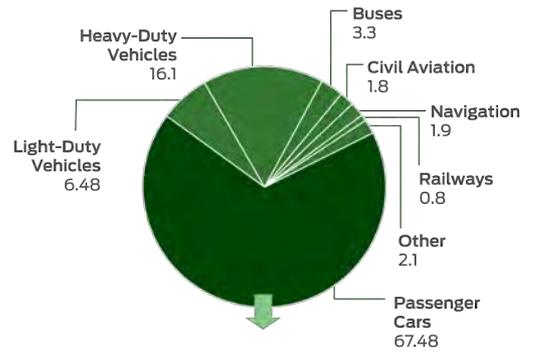
### Europe (EU-28) by Sector



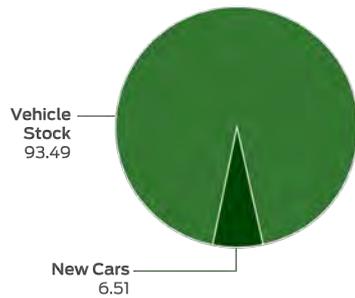
### U.S. Transportation



### Europe (EU-28) Transportation



### U.S. Passenger Cars



### Europe (EU-28) Passenger Cars



## Global CO<sub>2</sub> Emissions

	Percent
	2012
<b>U.S.</b>	<b>16.1</b>
<b>Europe (EU-28)</b>	<b>11.6</b>
Other North America	3.1
Central and South America	4.3
Eurasia	8.0

Middle East	6.2
Africa	3.68
China	26.1
India	5.6
Japan	3.85
Other Asia & Oceania	9.9
Other Europe	1.52

### U.S. by Sector

	Percent
	2012
<b>Transportation</b>	<b>34.3</b>
U.S. Territories	1.0
Industrial	15.3
Residential	5.7
Commercial	4.2
Electricity Generation	39.9

### Europe (EU-28) by Sector

	Percent
	2012
<b>Transportation</b>	<b>25.4</b>
Manufacturing	15.2
Residential	11.8
Commercial	5.0
Electricity Generation	40.2
Other	2.4

### U.S. Transportation

	Percent
	2012
<b>Passenger Cars</b>	<b>43.4</b>
Light-Duty Trucks	17.2
Other Trucks	22.3
Buses	1.0
Aircraft	8.3
Ships	2.3
Rail	2.5
Other	3.0

### Europe (EU-28) Transportation

	Percent
	2012
<b>Passenger Cars</b>	<b>67.48</b>
Light-Duty Vehicles	6.48
Heavy-Duty Vehicles	16.1
Buses	3.3
Civil Aviation	1.8
Navigation	1.9
Railways	0.8
Other	2.1

### U.S. Passenger Cars

	Percent
	2012
Vehicle Stock	93.49
New Cars	6.51

### Europe (EU-28) Passenger Cars

	Percent
	2012
Vehicle Stock	95.1
New Cars	4.9

1. Source: IEA, 2013, [CO<sub>2</sub> Emissions from Fuel Combustion Highlights](#) (pdf, 2.5Mb)

2. IEA. *Energy Technology Perspectives 2014*. ETP2014 transport summary online data.

3. IEA. *Energy Technology Perspectives 2014*. ETP2014 transport summary and scenario summary online data.

4. It is important to note that about 18 percent of the emissions from electricity and heating are generated by industrial uses, a fraction of which is from electricity and heat used to produce cars and trucks.



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# Climate Change Risks and Opportunities

Over the past decade, concerns about climate change, the volatile price of fuel and energy security – along with the global recession – have dramatically changed the automotive business.

This has created substantial risks for automakers but also opportunities for innovation that enable growth and expansion. Below we discuss how fuel economy and greenhouse gas emission regulations and changing consumer demand for fuel-efficient and cleaner vehicles provide risks and opportunities across our major markets. We also discuss the physical and supply chain risks to our business posed by climate change.

## Risks and Opportunities from Regulations and Consumer Demand for Fuel Economy

There is little doubt that the climate change issue has fundamentally reshaped automotive markets around the world. The climate change and fuel economy policy landscape is becoming more complex and interconnected with other market forces. The [Climate Change Policy section](#) of this report discusses regulatory developments in detail, but in brief, all of our major markets are increasingly shaped by government actions to regulate fuel economy and carbon dioxide (CO<sub>2</sub>) emissions, introduce low-carbon fuels and provide incentives to shift consumer and business behavior. Many governments are also actively involved in promoting the research, development and purchase of new vehicle and battery technologies. This trend in government policies has opened up significant opportunities for auto companies to deliver lower-carbon products and services.

At the same time, sales of fuel-efficient vehicles and alternative fuel and powertrain vehicles have been inconsistent and are strongly correlated to fuel prices, which are volatile. In the 1970s and 1980s, concerns about gasoline prices and price volatility drove a long-term trend toward consumer interest in more fuel-efficient vehicles. In more recent years, however, lower and fluctuating fuel prices have reversed the trend. For example, in the U.S. from 1990 to 2005, gasoline prices remained relatively low, and sales of less fuel-efficient SUVs and light trucks increased compared to sales of smaller vehicles. From 2006 to 2010 this trend reversed: gasoline prices increased significantly, and sales of more fuel-efficient cars increased as well. More recently, from mid-2014 through mid-2015, there has been a huge decline in crude oil prices, which has translated into reduced gasoline prices, leading to another decrease in sales of more fuel-efficient and alternative powertrain vehicles. The reduced consumer

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*There are significant opportunities for auto companies to deliver lower-carbon products and services.*

*Sales of fuel-efficient vehicles and alternative fuel and powertrain vehicles have been inconsistent over time and are strongly correlated to fuel prices.*

demand for advanced fuel-efficient and alternative powertrain vehicles creates future compliance risks for automotive companies. To achieve success, efforts among stakeholders must be coordinated and aligned.

Gasoline prices are not the only factor influencing consumers' vehicle purchase decisions, but they have consistently been one of the most important. There has been some increase in consumers who want "greener" vehicles even when gasoline prices are not high, and we are ready to meet their needs. Consumer concern about climate change is one driver of demand for greener vehicles, and this represents an important opportunity for automakers that can deliver more fuel-efficient and lower-carbon products and services. At this point, however, this consumer segment remains relatively minor in most of our major markets; to address climate change, product solutions that achieve broad consumer acceptance are necessary.

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*Ford is ready to meet consumers' demand for "greener" vehicles.*

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In many markets, energy security concerns are also a driver of fuel-economy regulation and alternative fuel development, as governments and consumers seek to rely as much as possible on domestic sources of transportation fuel and reduce imports of petroleum products. However, recent increases in the production of oil, gas and biofuels in the U.S. are paving the way for the U.S. to become energy independent in the future. We expect energy security to become less of a driver for fuel-efficient and cleaner vehicles in the U.S. moving forward.

## Investor Concerns About Climate Change

Investors are showing greater concern about climate change as a material risk for many companies. A variety of voluntary public registries and information services (such as the CDP, formerly known as the Carbon Disclosure Project) are providing information to investors about greenhouse gas emissions, while in some countries, companies are required to disclose information about their climate risks. Thus, providing climate-change-relevant information to investors and shaping our business strategy with climate change in mind are important elements of maintaining access to capital.

## Physical Risks

Global climate change raises the potential for shifting patterns of extreme weather and other risks to our facilities. For insurance purposes, we assess the risks each of our facilities faces (with input from third-party engineers) at least annually. This risk assessment is updated based on new data and takes into account the risk of exposure to hurricanes, tornadoes, other storms, flooding and earthquakes. As a result of this process, we believe we have a good understanding of the physical risks faced by our facilities and how those risks are changing over time.

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*We assess the risks each of our facilities faces with regard to shifting patterns of extreme weather.*

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Extreme weather has the potential to disrupt the production of natural gas, a fuel necessary for the manufacture of vehicles. Supply disruptions raise market rates and jeopardize the consistency of vehicle production. To minimize the risk of production interruptions, Ford has established firm delivery contracts with natural gas suppliers and installed propane tank farms at key manufacturing facilities as a source of backup fuel. Higher utility rates have prompted Ford to revisit and implement energy-efficiency actions that previously did not meet our internal rate of return. Climate change also has the potential to affect the availability and quality of water. We are examining this issue as part of our [water strategy](#).

## Supply Chain Risks

Our suppliers, which are located in more than 60 countries, are subject to market,

regulatory and physical risks as a result of greenhouse gas regulation and the impacts of climate change. These risks could affect their competitiveness or ability to operate, creating the potential for disruptions to the flow of supplies to Ford. For example, suppliers may be subject to reporting requirements and carbon fees or taxes or other emissions trading schemes, depending on where their operations are located.

Also see:

> [Supply Chain](#)

## Addressing these Climate Change Risks

The risks and opportunities related to climate change are very significant to our company. Everywhere we operate, the financial health of our company depends on our ability to predict market shifts of all kinds and to be ready with the products and services our customers demand.

Our product globalization strategy is designed to help us adapt to changing markets and regional preferences, and the risks and opportunities presented by the climate change issue. We have created global vehicle platforms that offer superior fuel economy, safety, quality and customer features. We then tailor each global platform to national or regional preferences and requirements. Our pledge that all of our new or significantly refreshed vehicles offer a popular powertrain model with leading fuel economy, coupled with a technology migration plan that is based on the science of climate change, positions us to keep pace with or get ahead of regulatory requirements. New technology is also cutting the time required to bring new vehicles to market, which helps us respond more effectively to the ever-increasing pace of change in our markets.

### READ MORE:

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*We have a comprehensive, science-based strategy for doing our part to reduce climate change.*

> [Ford's Climate Change Strategy](#)

---

*We support comprehensive, market-based government policies for addressing climate change*

> [Climate Change and Fuel Economy](#)

- 
- > [Sustainable Technologies and Alternative Fuels Plan](#)
  - > [Vehicle Fuel Efficiency and CO<sub>2</sub> Emissions Progress and Performance](#)
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# Ford's Climate Change Strategy

We have developed a science-based, global strategy to reduce our contribution to climate change and respond to the risks and opportunities posed by this issue.

Our strategy is based on the idea of climate stabilization, or doing our share to stabilize carbon dioxide (CO<sub>2</sub>) emissions in the atmosphere at 450 parts per million, the level that many scientists, businesses and government agencies have concluded may help to forestall or substantially delay the most serious consequences of climate change.

## Our Key Focus Areas

Our overall plan to contribute to climate stabilization focuses on:

- Continuously reducing the greenhouse gas (GHG) emissions and energy usage of our operations
- Developing the flexibility and capability to market lower-GHG-emission 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 GHG emissions

*We have specific CO<sub>2</sub> reduction goals for the vehicles we sell and for our own operations.*

Our strategy includes specific CO<sub>2</sub> reduction goals for the vehicles we sell and our own operations in all of our regions. Using a science-based CO<sub>2</sub> model, we have developed CO<sub>2</sub> reduction glide paths for our products and facilities in all of our major operating regions that drive our product planning, vehicle-specific fuel-economy targets and our facilities' energy and CO<sub>2</sub> goals.

### READ MORE:

Read more about how we developed our stabilization-based climate change strategy and CO<sub>2</sub> reduction targets.

- > [Developing Our Stabilization-Based Climate Change Strategy and CO<sub>2</sub> Reduction Targets](#)

We are making progress on our vehicle CO<sub>2</sub> reduction goals in all of our regions.

- > [Vehicle Fuel Efficiency and CO<sub>2</sub> Emissions Progress and Performance](#)

- > [Climate Change and Fuel Economy](#)
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## Climate Change and Environment

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# Climate Change Strategic Principles

Our approach to greenhouse gas (GHG) stabilization is aligned around the following key strategic principles:

1. Technical, economic and policy approaches to climate change need to recognize that all carbon dioxide (CO<sub>2</sub>) molecules (or GHG equivalents) produced by human activities make the same contribution to climate change. Once those molecules reach the atmosphere, they contribute to the greenhouse effect, regardless of their source. However, the cost of reducing those emissions varies significantly depending on their source, and we should attempt to achieve the most economically efficient solutions possible.
2. The transportation sector represents a closely interdependent system, characterized by the equation: "Vehicle + Fuel + Driver = GHG emissions." Each element in this equation depends on the others. For example, vehicle manufacturers can bring to market flexible-fuel vehicles, but successfully reducing GHG emissions depends on fuel companies providing renewable biofuels, as well as consumer demand for the vehicles and fuels.
3. Future developments in technologies, markets, consumer demand and policies are uncertain. The business strategies that Ford implements, and the public policies that we encourage, must have the flexibility to succeed in a range of potential scenarios.
4. Early affordable steps to reduce GHG emissions from our products and processes 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.

### READ MORE:

*We have a comprehensive, science-based strategy for doing our part to reduce climate change.*

> [Ford's Climate Change Strategy](#)

*We support comprehensive, market-based government policies for addressing climate change.*

> [Climate Change and Fuel Economy](#)

> [Developing Our Stabilization-Based Climate Change Strategy and CO<sub>2</sub> Reduction Targets](#)

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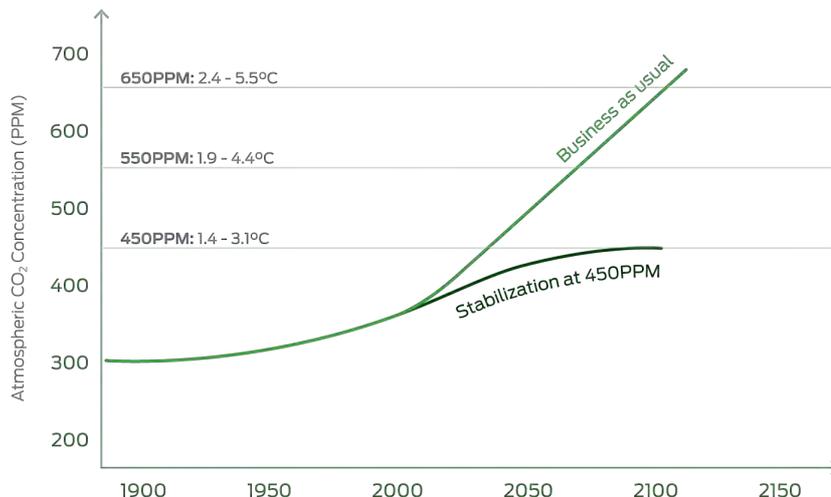
# Developing Our Stabilization-Based Climate Change Strategy and CO<sub>2</sub> Reduction Targets

Throughout this report, we refer to Ford's climate goals as "science-based" – specifically, based on the science of climate stabilization.

An advantage of this approach is that it gives us an objective, long-term goal focused on an environmental outcome – the stabilization of carbon dioxide (CO<sub>2</sub>) in the atmosphere. A disadvantage is that the goal can be difficult to explain and communicate. In this section, we delve into our science-based goal by discussing what stabilization means, how we use "glide paths" to align our product plans with emission reductions, how our CO<sub>2</sub> model works and how we use it in our planning.

## A Commitment to do Our Share

Our climate change strategy is based on a commitment to do our share to stabilize atmospheric CO<sub>2</sub> at 450 parts per million (ppm), because that is the level that many scientists, businesses and government agencies have concluded may help to forestall or substantially delay the most serious consequences of climate change (see graph below). Atmospheric CO<sub>2</sub> concentrations have already reached 400 ppm.<sup>1</sup>



Stabilizing atmospheric CO<sub>2</sub> emissions at 450 ppm will be incredibly challenging and will require major coordinated efforts by all sectors of the economy, industries, governments and consumers around the world. So how did we figure out what is "our share" in this stabilization commitment?

*We have a science-based model of global CO<sub>2</sub> emissions from different industries and regions.*

First, we developed a science-based model of global CO<sub>2</sub> emissions from different industries and regions. To develop the model, our researchers modified the Sustainable Mobility Project model (developed by the International Energy Agency) and combined it with global CO<sub>2</sub> emission-reduction pathways for varying levels of atmospheric CO<sub>2</sub> stabilization (as described by the Model for the Assessment of Greenhouse Gas Induced Climate Change, developed by the National Center for Atmospheric Research). Our scientists then calculated the CO<sub>2</sub> emission reductions required of new light-duty vehicles (LDVs) up to the year 2050 for a range of CO<sub>2</sub> stabilization levels and different regions of the world, based on projections of vehicle sales and scrappage. To assess the “share” of reductions required of new LDVs compared to other emissions sources, we used a simplifying assumption of the same percentage CO<sub>2</sub> emission reductions across all sectors and industries.

We then calculated the emission reduction levels for LDVs over time to develop “CO<sub>2</sub> glide paths” for the LDV sector. The glide paths take into account regional differences in vehicle size and fuel consumption, government regulations and biofuel availability. Although the initial (current) CO<sub>2</sub> emissions rate varies considerably by region, to provide the significant emission reductions needed, all regions need to move toward similar targets. For the light-duty vehicle sector to meet the 450 ppm CO<sub>2</sub> emissions limits, all automakers must reduce their LDV emissions by the proportion prescribed by the CO<sub>2</sub> glide paths (see graph below).

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*We have developed “CO<sub>2</sub> glide paths” for light-duty vehicles.*

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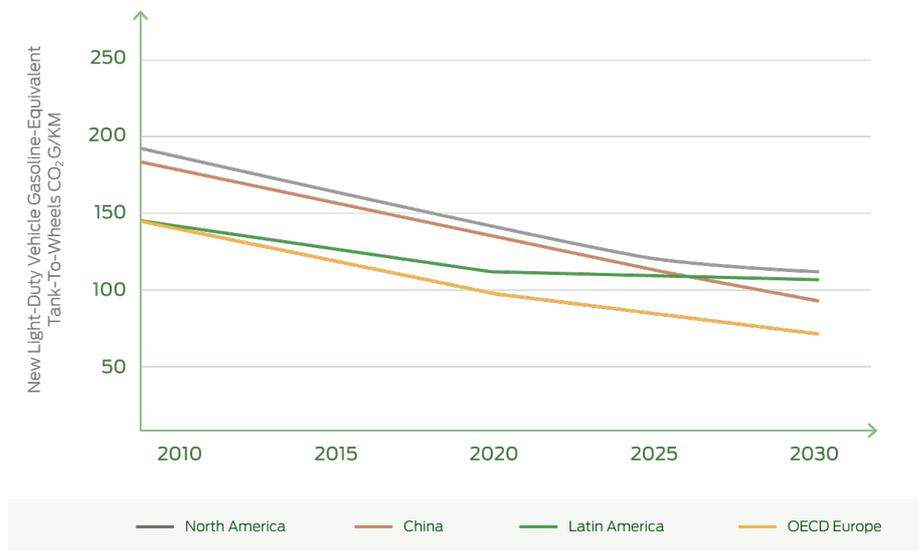
We have shared our thinking behind the development of these industry-average targets with interested stakeholders and have received positive feedback. We have also published the methodology behind the development of our CO<sub>2</sub> glide paths in the peer-reviewed scientific literature.<sup>2</sup>

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*We share our thinking with interested stakeholders.*

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### Industry-Average CO<sub>2</sub> Glide Paths<sup>3</sup>



### Translating CO<sub>2</sub> Glide Paths into Technology Plans and Vehicle Targets

We have used this model of CO<sub>2</sub> stabilization at 450 ppm to calculate region-specific CO<sub>2</sub> glide paths for our consumer and commercial vehicles in all of our major operating regions to meet this goal. We have also applied the CO<sub>2</sub> glide path methodology to develop CO<sub>2</sub> targets for our facilities. These glide paths help to steer drive our vehicle technology plans and our facilities’ energy and CO<sub>2</sub> reduction efforts.

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*Glide paths are helping to steer our vehicle technology plans and CO<sub>2</sub> reduction efforts.*

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Our CO<sub>2</sub> model is not intended to provide “the answer,” but rather a range of possible vehicle and fuel solutions that contribute to a pathway to CO<sub>2</sub> reductions and, eventually, climate stabilization. Our [Sustainable Technology and Alternative Fuels Plan](#) – and the technology and product actions it spells out – is based on options developed through this modeling exercise.

We compare the glide paths to competitive and regulatory factors in each region to inform long-term technology plans and identify opportunities and risks.

Our glide paths serve as an approximate guide rather than a precise limitation, and they are roughly consistent with the overall trajectory of existing and proposed fuel economy and vehicle CO<sub>2</sub> regulations in a number of markets<sup>4</sup>. In the absence of certainty about future regulations, the glide paths provide a good guide for long-term product development planning. By following the 450 ppm CO<sub>2</sub> glide path, the industry would reduce global well-to-wheels absolute CO<sub>2</sub> emissions by about 450 million metric tons (a reduction of 14 percent)<sup>5</sup> between 2010 and 2030. Ford’s share is estimated to be about 1 percent of the global LDV fleet’s emissions.

*Also see:*

> [Ford’s Greenhouse Gas Footprint](#)

We caution that while our product development plans are based upon delivering long-term reductions in CO<sub>2</sub> emissions from new vehicles that are similar to those shown for the industry-average glide paths, we anticipate that the year-over-year reductions will vary somewhat from the glide paths. In some years the reductions will be greater than those shown in the glide paths, and in other years they will be less. That is because delivering on these targets will be dependent to a large degree on market forces that we do not fully control (e.g., changes in energy prices and changes in the mix of vehicles demanded by the consumers in the markets in which we operate). Furthermore, our product strategy is based on multiple inputs, including regulatory requirements, competitive actions and technology plans.

We review our alignment with the stabilization glide path annually. Because of the long-term view of the model, we only update the assumptions and input data in the CO<sub>2</sub> model glide paths on a five-year basis. In 2012 we completed the first update since the glide paths were implemented. As part of this review, we assessed our glide path analysis methodology and incorporated new forecasts for vehicle sales and the latest data on the CO<sub>2</sub> intensity of fuels. The adjustments to glide paths based on these changes were minor. Between major updates, we conduct sensitivity studies to understand the effect of global changes, such as economic conditions, biofuel availability, or regulations, on the glide paths.

In other CO<sub>2</sub> modeling efforts, we have explored which combinations of vehicle and fuel technologies might be most cost-effective in the long-term stabilization of atmospheric CO<sub>2</sub> concentrations. Specifically, we developed a detailed description of light-duty vehicles in a model of global energy use for 2010 to 2100. Several technology cost cases were considered. We found that variation in vehicle technology costs over reasonable ranges led to large differences in the vehicle technologies utilized to meet future CO<sub>2</sub> stabilization targets. We concluded that, given the large uncertainties in our current knowledge of future vehicle technology costs, it is too early to express any firm opinions about the future cost-effectiveness or optimality of different future fuel and vehicle powertrain technology combinations.<sup>6</sup> This conclusion is reflected in the portfolio of fuel and vehicle technologies that are included in our sustainability strategy. We believe the model will provide valuable insights into cost-effective mobility choices in a future carbon-constrained world.

As climate science, alternative fuels and technologies advance, we are considering a number of ways to refine and adjust our science-based CO<sub>2</sub> targets and modeling in future updates of the model.

Ford's leadership in using climate science to set our CO<sub>2</sub> targets has been recognized externally. In 2012 we received a Goal-Setting Certificate at the U.S. Environmental Protection Agency's Climate Leadership Awards Ceremony and Conference for our global manufacturing CO<sub>2</sub> strategy.

**READ MORE:**

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*We assess our greenhouse gas (GHG) footprint across our value chain to identify and prioritize the key areas on which to focus our GHG emissions reduction efforts.*

> [Ford's Greenhouse Gas Footprint](#)

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*We are implementing a suite of fuel efficiency technologies as well as alternative fuel and powertrain vehicles.*

> [Sustainable Technologies and Alternative Fuels Plan](#)

---

*We are making progress on our vehicle CO<sub>2</sub> reduction goals in all of our regions.*

> [Vehicle Fuel Efficiency and CO<sub>2</sub> Emissions Progress and Performance](#)

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1. Source: [www.co2now.org](http://www.co2now.org), accessed 3-6-15.
  2. S.L. Winkler, T.J. Wallington, H. Maas and H. Hass, "[Light-Duty Vehicle CO<sub>2</sub> Targets Consistent with 450 ppm CO<sub>2</sub> Stabilization](#)," *Environ. Sci. Technol.* (2014).
  3. The E.U. and China glide paths were developed based on the New European Driving Cycle (NEDC), and the North America and Latin America glide paths were developed based on the Federal Test Procedures (FTP), which are the testing requirements used by governments in these regions to assess the emission levels of car engines and/or fuel economy in light-duty vehicles.
  4. We note that, while the glide paths can provide a framework for assessing regulatory proposals at a high level, our ability to comply with specific GHG regulations hinges on the details of the regulatory scheme in the context of the relevant market.
  5. S.L. Winkler, T.J. Wallington, H. Maas and H. Hass, "[Light-Duty Vehicle CO<sub>2</sub> Targets Consistent with 450 ppm CO<sub>2</sub> Stabilization](#)," *Environ. Sci. Technol.* (2014).
  6. M. Grahn, E. Klampfl, M. Whalen and T.J. Wallington, "Sustainable Mobility: Using a Global Energy Model to Inform Vehicle Technology Choices in a Decarbonised Economy," *Sustainability*, 5, 1845-1862 (2013).

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# Water

Water scarcity and water quality degradation rank among the biggest threats facing our planet. According to the World Economic Forum's Global Risks 2015 report,<sup>1</sup> water crises – from floods to droughts to pollution – were ranked as the number-one greatest risk facing the world, in terms of possible global impact.

And at Ford, we see water as far more than an environmental concern. Since 2012, we have recognized a basic human right to clean, affordable drinking water and adequate and accessible sanitation. Through our water strategy, we seek to uphold and respect that right.

*Our water strategy recognizes the human right to clean, affordable drinking water, and adequate, accessible sanitation.*

## Reducing Our Water Impacts

We have focused on reducing our water impacts since 2000, when we first began setting year-over-year reduction targets as part of our Global Water Management Initiative. Our efforts around water have evolved over the years; we have moved beyond merely reducing the water footprint of our own facilities to working more holistically outside our corporate walls, addressing water concerns in our supply chain and our broader communities.

### Meeting Our Water-Reduction Goals

We set a global manufacturing water-use-per-vehicle reduction goal of 30 percent by 2015, using a 2009 baseline. We achieved this goal two years ahead of schedule. So, in 2014 we began the process of updating our global manufacturing water strategy and setting a new long-term target to reduce water use per vehicle.

During 2014, we reduced our water use per vehicle by 1.25 percent and our absolute water use by 3 percent, compared to 2013. Our target for 2015 is a reduction of 2 percent per vehicle produced, compared to 2014.

## Our Corporate Water Strategy

In 2014 we published our [corporate water strategy](#), which builds upon our 2011 water strategy for our manufacturing operations. It is designed to effect substantial, sustainable and measurable impacts within our own facilities, across our supply chain and in our regions of operation. Our water strategy complements our overall [human rights policy](#) (Policy Letter 24: Code of Human Rights, Basic Working Conditions and Corporate Responsibility).

We believe that business has a key role to play in finding sustainable solutions to current and future global water challenges. As an industry leader with more than 180,000 employees worldwide and manufacturing facilities or distribution channels across six continents, our reach enables large-scale positive impact.

**READ MORE:**

*We recognize a basic human right to clean, affordable drinking water and adequate and accessible sanitation.*

> [Ford's Water Strategy](#)

*We are reducing water use across our global operations.*

> [How We're Reducing Our Water Use](#)

- > [Water Management](#)
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- 
1. For each of 28 risks, survey respondents were asked, "How likely is this risk to occur globally within the next 10 years?" and "What is the estimated impact globally if this risk were to materialize?" Both were ranked on a scale of 1 to 5 by the nearly 900 experts who responded. [Download the World Economic Forum survey](#)

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# Ford's Water Strategy

In 2014, we formally adopted a corporate water strategy. This strategy expands on our previous efforts to reduce water in our own operations by adding a commitment to address water impacts beyond our “fence line,” including working with suppliers and local communities on water issues.

A centerpiece of this strategy is meeting increasingly stringent water-reduction goals for our own operations. In 2014, we started the process of updating our global manufacturing water goals – including developing a new water-use-per-vehicle reduction target. This new target will build on our success in meeting – two years early – our previous water-use-per-vehicle goal of a 30 percent reduction from 2009 to 2015.

We are reducing our own water use by:

- seeking opportunities for continuous improvement using methodologies such as water assessments,
- evaluating and implementing innovative technologies to reduce water use and increase water recycling in manufacturing operations, where feasible, and
- incorporating consideration of water availability and risk in technology implementation.

Also see:

> [How We're Reducing Our Water Use](#)

We are also working to improve water impacts for our employees and communities by:

- ensuring all employees have access to potable water, sanitation and hygiene in our workplaces,
- working with key local stakeholders in the communities in which we operate, and
- meeting local quality standards or Ford global standards for wastewater discharge (whichever are more stringent).

We know that some of our facilities are located in regions where water supplies are already scarce. A changing global climate also has the potential to further impact the quality and availability of water. We cannot be certain that we will always have access to water of the quantity and quality that our operations require. Therefore, our water strategy prioritizes our plants located in areas where water is scarce.

Our water strategy aligns with the core elements of the [CEO Water Mandate](#), a private-public initiative launched by the UN Secretary-General in 2007. Companies that support the CEO Water Mandate commit to implementing the framework's six core elements for water management and pledge to publicly report their progress annually. Ford endorsed the Water Mandate in 2014.

The graphic below summarizes how our water strategy – or Blue Plan of Action –

incorporates the six elements of the CEO Water Mandate to help guide us toward a position of industry leadership.

## Ford's Blue Plan of Action



- **Direct Operations** – We are reducing water use and water impacts from our operations by implementing a wide range of water-saving technologies. Read more about [water use in our operations](#).
- **Supply Chain** – We are working with our suppliers to assess their water footprints. Our goal is to share our knowledge about the water-savings initiatives we have implemented across our plants with our suppliers to encourage them to implement some of these initiatives within their own facilities. Read more about our [supply chain water programs](#).
- **Collective Action** – The water issue is a challenge too large for one company to tackle on its own. We are collaborating with others, both public and private, to develop and implement best practices that address key water challenges (including access to water, sanitation and hygiene) and to raise awareness of these issues.
- **Public Policy** – We are collaborating with governments where we operate to promote sound water management practices for sustainability. Read more in the [public policy section](#).
- **Community Engagement** – We're investing in water stewardship projects around the world, especially in areas where access to potable water is limited. As we expand into new markets in more water-stressed regions, we are increasing our engagement with local communities on water issues. Read more in the [Communities section](#).
- **Transparency** – Transparency underpins all of the other five areas. We develop communications and reporting channels that promote accountability, including:
  - publishing and sharing our company water strategy (including targets and results) in relevant corporate reports;
  - publishing and sharing our global water usage for direct operations on both an absolute and per-vehicle-produced basis; and
  - being transparent in discussions with governments and other public authorities on water issues.

### READ MORE:

We are working with our suppliers on water-related issues.

- > [Environmental Sustainability in Our Supply Chain](#)

Our community investment and engagement efforts also focus on water.

- > [Case Study: Engaging With Our Communities on Water](#)

- > [Water Risks and Opportunities](#)
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# Water Usage in the Vehicle Life Cycle

To better assess our water-related impacts, we have estimated the freshwater withdrawal (i.e., total water withdrawn which may or may not be returned to the source) and consumption (i.e., water withdrawn and not returned to the source) for the life cycle of a model year 2012 Ford Focus gasoline internal combustion engine vehicle (ICEV) and battery electric vehicle (BEV).

The analysis includes water used in material production, parts production, vehicle assembly, vehicle use (fuel production and distribution) and vehicle disposal at end of life. Both direct and indirect water usages were accounted for throughout the life cycle based on a lifetime driving distance of 160,000 miles. For the vehicle use-phase water analysis, the typical U.S. gasoline, which includes 10 percent ethanol (E10), and the U.S. average electric grid mix was assumed for the Focus ICEV and Focus BEV, respectively.

We estimated U.S. average life cycle water withdrawal of 530 cubic meters (m<sup>3</sup>) and consumption of 130 m<sup>3</sup> for the Focus ICEV using E10 gasoline. For the Focus BEV, the life cycle water withdrawal was estimated to be 3,770 m<sup>3</sup>, while water consumption was estimated to be 170 m<sup>3</sup> (comparable to that for the ICEV). The relatively large water withdrawal associated with the BEV's use phase reflects the substantial amount of water needed for cooling in coal, nuclear and natural gas power plants. In comparison, the water needed to produce petroleum fuels is much less.

The analysis also found that the greatest water consumption occurs during the use phase. Although the car itself does not consume a lot of water, this is the most water-intensive stage due to the water used to produce the gasoline or electricity. This highlights the importance of increasing vehicle energy efficiency and reducing the water consumption associated with fuel production, to enhance sustainability. In the supply chain, the production and processing of materials (e.g., steel and aluminum) require the most water. Identifying which portions of the supply chain are most water intensive allows us to better assess the business risk associated with using suppliers in potentially water-stressed areas.

## Life Cycle Water Consumption

### Focus 2012 ICEV Life Cycle Water Withdrawal

	<i>Withdrawal (m<sup>3</sup>)</i>
Materials	123
Manufacturing	77
Assembly	48

Fuel Production	260
End of Life	23

## Focus 2012 ICEV Life Cycle Water Consumption

	Consumption (m <sup>3</sup> )
Materials	16
Manufacturing	4
Assembly	3
Fuel Production	107
End of Life	1

### READ MORE:

*Read more on how we are using life cycle assessment tools to understand and reduce our environmental impacts.*

> [Life Cycle Assessment](#)

*We are reducing water use across our global operations.*

> [Water Use in Our Operations](#)

*We are working with our suppliers on water issues.*

> [Environmental Sustainability in Our Supply Chain](#)

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# Water Risks and Opportunities

Although the making of vehicles is not especially water intensive compared to making many other products, water scarcity can have an appreciable impact on our manufacturing operations. We use water in a number of key manufacturing processes in our plants, including vehicle painting, and water is used at every point in our supply chain. Therefore, our water-related risks come not only from being a direct water user, but also from being a large purchaser of materials, parts and components that require water for their manufacture.

Historically, water has been a relatively inexpensive resource. But that's changing, and the cost of using water is expected to continue increasing in the coming decades. For a manufacturing company like ours, that could mean higher operating costs. From a business perspective, it is important for us to strategically reduce water consumption now, before we see significant price increases or the implementation of further water-use restrictions.

Increasing water scarcity means industrial needs can be at odds with community and environmental needs and could pose challenges to our commitments to both. Industrial facilities in water-scarce areas may have reduced access to water and/or may endure rising water costs. Working on solutions helps us to secure a "license to operate" in diverse global locations and can enhance our reputation in local communities.

Also see:

> [Case Study: Engaging With Our Communities on Water](#)

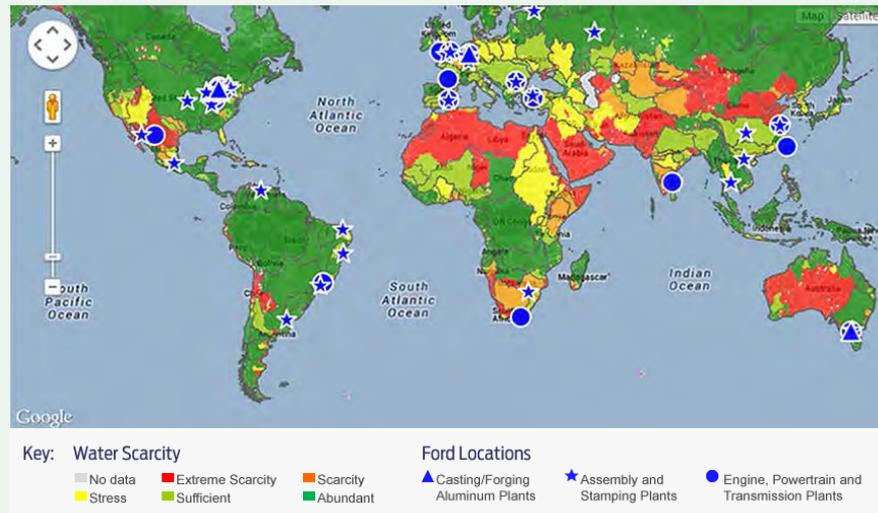
Ford has been growing in many areas of the world where water access and availability are concerns. We have identified which of our operations are located in water-scarce regions using watershed-level data in the Global Water Tool, developed by the World Business Council for Sustainable Development (WBCSD). Previously, we used country-level data in the Global Water Tool to analyze our operations. However, water availability is a local issue, and country-level data that averages water availability across multiple watersheds may mask important regional variations. Therefore, we conducted the latest analysis using more detailed watershed-level data.

According to our analysis, about 24 percent of our operations are located in regions that are considered to be at risk for water scarcity. We also evaluated which of our operations are projected to be in water-scarce regions by 2025. According to the analysis, approximately 25 percent of our operations are projected to be in such regions.

Our facilities in Mexico are located in water-scarce regions. Our manufacturing facility in Cuautitlán, Mexico, for example, is already subject to water-withdrawal limitations. Several of our facilities in our Asia Pacific region and Middle East and Africa region are in areas that are currently water scarce, or are expected to be in the near future.

In response to this analysis, we developed our water strategy to prioritize addressing our water use, supplier water use and community water issues in these water-stressed regions.

### Ford Operations: 2025 Projected Annual Renewable Water Supply per Person



The WBCSD's free tool enables companies to map their facilities and assess several water-related risks. For more information on the tool and how it works, see the [WBCSD website](#).

Source: World Business Council for Sustainable Development's Global Water Tool (GWT) v2 uses several datasets. Annual renewable water supply per person projections for 2025 are obtained from the Pilot Analysis of Global Ecosystems: Freshwater Systems. Washington DC: WRI produced by C. Revenga, J. Brunner, N. Henninger, K. Kassem and R. Payne (2000).

#### READ MORE:

We are reducing water use across our global operations.

> [Water Use in Our Operations](#)

Read more about how we assess risks and opportunities associated with climate change, another critical environmental issue.

> [Climate Change Risks and Opportunities](#)

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## Water Use in Our Operations

Between 2013 and 2014, we reduced our absolute water use by 3 percent and our water use per vehicle produced by 1.25 percent.<sup>1</sup> Between 2000 and 2014, we reduced our total global water use by 62 percent, or more than 10 billion gallons (see graphic below). That's equivalent to the water used for 1 billion five-minute showers, based on figures from the U.S. Environmental Protection Agency, or enough to fill more than 15,000 Olympic-sized pools. From 2000 to 2014 we also decreased the total amount of water used around our global facilities from 64 million cubic meters per year to 24 million cubic meters.

### 10.6 billion gallons of water is equivalent to...



We set a global goal to reduce water use per vehicle produced by 30 percent by 2015, using a 2009 baseline. We achieved this goal in 2013 – two years ahead of schedule. Our target for 2015 is a reduction of 2 percent per vehicle produced from 2014.

In 2013, we began tracking process water discharge at our manufacturing plants globally. Process water discharge is defined as the water used in manufacturing (including facility air conditioning) and released to the environment or discharged offsite. (It does not include sanitary sewage or storm water.) We also began tracking water reuse for our water treatment plants. We are reporting data for 2014 – our first full year for which these data are available – for both of these metrics (see [data section](#)). We will continue tracking and reporting these data moving forward, providing greater transparency around water usage within

#### Ford Recognized for Helping to Build a “Blue” Economy

Ford was the only automaker featured in the [Michigan Blue Economy Report](#), which recognized Ford as a company leading the way in developing new water technology products and services. This report – by the Michigan Economic Center at Prima Civitas and the Grand Valley State University’s Annis Water Resources Institute – is designed to spur strategic actions to expand and grow the state’s already blue economy, and help Michigan to become the world’s freshwater and water innovation capital.

our facilities.

## Global Water Use per Vehicle Produced

Cubic meters per vehicle

2009	2010	2011	2012	2013	2014
5.68	5.02	4.67	4.23	4.04	3.99

## Total Global Water Use

Million cubic meters

2009	2010	2011	2012	2013	2014
24.4	26.2	25.6	23.7	24.9	24.1

Also see:

[Global Water Use by Source](#)

### READ MORE:

Read more about other ways we are greening our operations.

> [Greening Our Operations](#)

1. We had set a goal to reduce water use per vehicle produced by 2 percent from 2013 to 2014. We did not quite meet this goal, reducing water use per vehicle by 1.25 percent in this timeframe, because we had an unusually high number of new product launches (we launched 24 all-new or significantly refreshed products globally in 2014) and factory retoolings, which reduces the number of vehicles we produce (the denominator of this metric) without proportionally reducing our overall water use (the numerator of this metric).
2. U.S. Environmental Protection Agency.
3. California Energy Commission.

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# How We're Reducing Our Water Use

We've accomplished substantial reductions in water use by cutting the water we use in everything from cooling towers to washing parts to paint operations. We are investing in water-saving technologies and process improvements across our global operations.

Wherever feasible, we take successful projects and mirror them in other locations. Our newest plants use a set of advanced and environmentally friendly technologies to dramatically cut water use. Many of these new systems require substantial capital investments, so we have been adding them on a rolling basis as we update equipment and bring new facilities online, especially in areas where water is more scarce. We are also using water assessment tools to better understand our water use and more effectively target our water-reduction efforts.

The graphic below provides a summary of our key water-reduction technologies and process improvements.

## Membrane Biological Reactors and Reverse-Osmosis Processes



We use membrane biological reactors (MBR) and reverse-osmosis processes to recycle water from our on-site wastewater treatment plants, which allows us to avoid using high-quality water suitable for human consumption in our manufacturing processes. We have focused on implementing this technology at our production facilities that are located in more arid regions. By doing so at plants in Chihuahua and Hermosillo, Mexico; Pretoria, South Africa; Chennai, India; and Chongqing, China, we have been able to reuse more than 976,000 cubic meters of water, which means we have not had to withdraw that water from the environment.

## Minimum Quantity Lubrication



We use a "dry-machining" process to lubricate cutting tools with a very small amount of oil, rather than the conventional "wet-machining" process that required large amounts of metal-working fluids and water to cool and lubricate the tools. For a typical production line, dry machining – also known as Minimum Quantity Lubrication (MQL) – can save more than 280,000 gallons of water per year.

We currently have this capability in six plants around the world (one plant each in China, Romania and Germany and three plants in Michigan). We will nearly double that number in the next few years.

MQL has other benefits in addition to water savings. It reduces the amount of oil needed to machine an engine or transmission by 80 percent and, by avoiding the need for a coolant system across most engine production lines, MQL helps to reduce energy use. MQL also improves plant air quality by eliminating the airborne mist produced by traditional wet machining.

### 3-Wet Paint Technology



This technology enables the consolidation of painting activities in an integrated booth, offering the potential to eliminate one booth water wash section, depending on plant design. The technology also provides significant [energy savings and reductions in carbon dioxide \(CO<sub>2</sub>\) emissions](#) and [volatile organic compound \(VOC\) emissions](#).

### Dry Paint Overspray System



This system eliminates water usage from the painting process, resulting in an 80 percent water savings for air conditioning/air tempering and 100 percent water savings from paint-over-spray separation, based on production volume of 158,000 units per year.

### Cooling Tower Technologies



We are pilot testing ways to save water at our cooling towers, which are one of the biggest water users at our plants. We're trying new technologies that soften the water so that there are fewer salts to cause equipment scaling. This allows us to reuse the water through the cooling towers many more times before the hardness requires us to bring fresh water in, reducing the amount of fresh water needed for cooling processes and comfort cooling.

### Sustainable Storm Water Practices



We are also using green building and landscaping practices to reduce our water impacts. For example, the Dearborn Truck Plant at the Ford Rouge Center incorporates extensive natural storm water management systems and what was then the largest green roof in the world. (Studies have shown that the roof has reduced runoff by 42 percent.) In 2012, we replaced a portion of the roof at our world headquarters in Dearborn, installing 5,000 square feet of green sedum on the west side of the building. Our Louisville, Kentucky, and Cuautitlán, Mexico, plants installed porous pavement systems in the parking areas to reduce the amount of

storm water runoff.

## Water Assessments and Metering



We are conducting water assessments to help us gain a better understanding of our internal water usage and more effectively target our water-reduction efforts. As of early 2015, we have conducted assessments at 17 sites in eight countries and continue to add new plants for assessment each year. We are in the process of evaluating the results to determine what measures can feasibly be taken to reduce water and save our company money at the same time. We are also increasing usage of internal water metering to identify additional water-saving opportunities and drive conservation behaviors and control of water usage to the department level.

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# Greening Our Products

We are developing new approaches to mobility that will reduce the carbon footprint and environmental impacts of transportation in the future. But for the near term, cars and trucks remain central to our business.

So we are evolving our vehicles to deliver benefits to our environment and climate today. In this section we report on the current environmental performance of our products and our efforts to “green” our products, or improve their environmental impacts.

### READ MORE:

*We are implementing a suite of fuel efficiency technologies as well as alternative fuel and powertrain vehicles.*

> [Sustainable Technologies and Alternative Fuels Plan](#)

*We consider the impacts of materials at every stage of a vehicle's life cycle.*

> [Sustainable Materials](#)

- > [Life Cycle Assessment](#)
- > [Vehicle Fuel Efficiency and CO<sub>2</sub> Emissions Progress and Performance](#)
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# Life Cycle Assessment

We use a life cycle approach to understand, assess and reduce the adverse impacts of our products. Life cycle assessment considers the materials and energy use and emissions generated over the [entire life cycle of our products](#), from cradle to grave.

For vehicles, this includes the environmental burdens associated with mining ores, producing materials (e.g., steel, aluminum, brass, copper, plastics, etc.), fabricating them into parts, assembling the parts into a vehicle, operating the vehicle over its entire lifetime, producing fuel for the vehicle, maintaining the vehicle and finally, dismantling the vehicle at the end of its life. We use the knowledge gained from this kind of analysis to provide a holistic understanding of the impacts of our products and help us balance environmental, social and economic aspects in our product development process.

We are incorporating life cycle assessment (LCA) in different ways across our business functions. For example, our research teams use LCA to filter and prioritize projects, and engineers use LCA to help select more environmentally benign materials and designs. As our product portfolio evolves from vehicles powered by traditional internal combustion engines, running on petroleum-based gasoline or diesel, to a wider range of powertrains and fuels, this type of analysis becomes increasingly important and complex. Therefore, we are increasing our use of LCA to understand the relative impacts and benefits of alternative powertrains, such as electrified vehicles, and alternative fuels and to help customers understand and choose among the wide range of more sustainable vehicles available in today's marketplace.

We are also seeing increased use of LCA throughout the industry. For example, environmental advocates are performing their own LCAs in parallel with ours. These external analyses, which may use different assumptions and inputs, sometimes confirm and sometimes challenge our findings. We will continue to develop and implement a portfolio of LCA tools internally. Furthermore, we will continue to collaborate and engage with other LCA experts to increase the transparency of and balance in our methodologies and assumptions. Life cycle assessment is a relatively new scientific discipline, and we expect that LCA methodologies will evolve over time as the result of research by, and discussions with, our academic and industrial partners. Ford scientists will continue to play a leading role in this technical dialogue.

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*We use the knowledge gained from life cycle analyses to help us balance environmental, social and economic aspects in our product development process.*

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### READ MORE:

*Our first step in improving the life cycle performance of our products is to understand the environmental impacts of our products.*

> [Quantifying Our Environmental](#)

*We are applying the knowledge gained through life cycle assessment in real-world product development decisions.*

> [Applying Life Cycle Assessment](#)

*We assess our impacts and key issues across our value chain.*

> [Our Value Chain and Its Impacts](#)

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# Quantifying Our Environmental Impacts

The first step in improving the life cycle performance of our products is to understand the environmental aspects of our products and the potential environmental impacts associated with them.<sup>1</sup>

Much of our work to understand the environmental impacts of our products has focused on understanding their life cycle greenhouse gas (GHG) emissions. While carbon dioxide (CO<sub>2</sub>) emissions are the largest contributor to global warming, we also include other greenhouse gases and express them in terms of CO<sub>2</sub> equivalents (CO<sub>2</sub>e.). Beyond greenhouse gases, we are also working to understand the [life cycle water impacts](#) of our products and the different fuels they use.

## Assessing Life Cycle Vehicle GHG Emissions

Estimates of vehicles' total life cycle GHG emissions vary depending upon the specifics of the vehicle analyzed, including its powertrain and fuel type.

For conventional gasoline- and diesel-powered vehicles, most of the life cycle energy is consumed, and most of the life cycle GHG emissions are released, when the vehicles are driven, rather than when they are manufactured, maintained or recycled at end of life. In a study of conventionally fueled European Ford vehicles, for example, we found that the driving or use phase contributed 77 to 83 percent of the total life cycle vehicle emissions, depending on the engine and fuel type. Vehicles with better fuel economy reduce the use phase contribution to life cycle GHG emissions. For conventionally fueled gasoline and diesel vehicles, however, the use phase remains the dominant phase for many environmental impacts. Also, there are significant differences in total life cycle GHG emissions across different conventionally fuelled vehicle types. For example, across vehicle and engine sizes, modern diesel-fueled passenger cars generally have lower life cycle GHG emissions than modern gasoline-fueled cars.

For plug-in hybrid electric vehicles (PHEVs), battery electric vehicles (BEVs) and hydrogen-powered fuel cell vehicles (FCVs), most of the life cycle GHG emissions are released during the production of the electricity or the hydrogen that provides the energy for the vehicle. The portion of GHG emissions shifted from vehicle operation to fuel production is greatest for BEVs and FCVs – which are powered entirely by electricity or hydrogen – but is also significant for PHEVs. This makes it all the more important to use a life cycle perspective, which takes into account fuel production (often referred to as well-to-tank analysis) as well as vehicle operation (often called tank-to-wheels analysis), when assessing overall GHG emissions for alternative fuel and powertrain vehicles.

The overall life cycle CO<sub>2</sub> emissions for BEVs, PHEVs and FCVs depends heavily on which fuels and processes are used to produce the electricity or hydrogen. Depending on the source of fuel used to produce electricity, BEVs and PHEVs have life cycle GHG benefits

over gasoline- and diesel-fueled vehicles. For example, in an internal study comparing the life cycle GHG emissions of a Ford Focus Electric BEV and a conventional gasoline-powered Focus, we found that when the Focus Electric is charged with electricity with a carbon intensity below 400 g of life cycle CO<sub>2</sub>e/kWh – such as the electricity currently used in California, Norway and France – it has a GHG benefit over a Focus with a conventional internal combustion engine (ICE), EcoBoost® engine or advanced diesel engine. A compact PHEV, such as the Ford C-MAX Energi, generally has lower life cycle GHG emissions than a gasoline Focus with EcoBoost when the latter is operating with electricity with a carbon intensity below 400 g of life cycle CO<sub>2</sub>e/kWh, and has emissions comparable to the conventional (non-EcoBoost) ICE vehicle when charged with electricity with an average U.S. GHG profile. In short, the benefits of BEVs and PHEVs are greater when using low-carbon electricity sources. Conversely, the benefits can disappear if electricity is all coal-based.

The GHG benefits of hybrid electric vehicles (HEVs) depend largely on driving conditions. HEVs do not draw power from the electrical grid, but are powered by both an internal combustion engine and an electric motor with a battery system. They have life cycle GHG emissions similar to advanced diesel vehicles when driven under conditions that maximize their overall efficiency, and they have GHG emissions similar to advanced fuel-efficient gasoline vehicles, such as Ford's EcoBoost-equipped vehicles, when driven under conditions that do not maximize fuel efficiency.

The figures below compare life cycle GHG emissions across a range of vehicle technologies, fuels and electricity mixes.

**FIGURE 1: GHG Emissions Across a Range of Vehicle Technologies, Fuels and Electricity Mixes**

*g CO<sub>2</sub>e/km*

	Well-to-tank (WTT)	Tank-to-wheels (TTW)	Electricity generation	Materials, Assembly, End-of-life (g/km)
Gasoline	61	195		31
Gasoline with Auto Start-Stop	59	190		31
Gasoline EcoBoost	57	183		31
Diesel	44	183		31
Gasoline Hybrid	44	137		33
Gasoline PHEV (US Average)	22	69	78.5	37
Gasoline PHEV (California Average)	22	69	36.5	37
Gasoline PHEV (Minnesota Average)	22	69	97	37
BEV (US Average)			176	50
BEV (California Average)			79	50
BEV (Minnesota Average)			209	50

**FIGURE 2: Life Cycle CO<sub>2</sub> Emissions per Kilometer Traveled for a Mid-Size Vehicle in the U.S. Based on the USDRIVE Cradle to Grave (C2G) Project <sup>2</sup>**

Select a vehicle characteristic:

- > Fuel economy
- > Range on tank/charge
- > Fueling/charging time
- > CO<sub>2</sub> emissions
- Well to tank
- Tank to wheels
- Electricity generation
- Vehicle operation
- Materials, assembly, disposal
- > Annual fuel cost

## Fuel economy<sup>3</sup>

<b>Gasoline (E10)<sup>11</sup> ICE</b>	~26 mpg
<b>Gasoline (E10)<sup>11</sup> ICE with Auto Start-Stop<sup>12</sup></b>	~27 mpg
<b>Gasoline (E10)<sup>11</sup> ICE GTDI (e.g., EcoBoost)<sup>13</sup></b>	~28 mpg
<b>Diesel ICE</b>	~35 mpg
<b>Gasoline Hybrid<sup>14</sup></b>	~37 mpg
<b>PHEV with 28 mile all-electric driving range – U.S. Average</b>	~96 mpge <sup>17</sup> (combined city and highway) in electric mode
<b>PHEV with 28 mile all-electric driving range – California Average<sup>15</sup></b>	~36 mpg using gasoline in hybrid mode
<b>PHEV with 28 mile all-electric driving range – Minnesota Average<sup>16</sup></b>	
<b>BEV with 70 mile single-charge driving range – U.S. Average</b>	89 mpge <sup>17</sup>
<b>BEV with 70 mile single-charge driving range – California Average<sup>15</sup></b>	
<b>BEV with 70 mile single-charge driving range – Minnesota Average<sup>16</sup></b>	

## Range on tank/charge<sup>4</sup>

<b>Gasoline (E10)<sup>11</sup> ICE</b>	~450 miles/tank
<b>Gasoline (E10)<sup>11</sup> ICE with Auto Start-Stop<sup>12</sup></b>	~460 miles/tank
<b>Gasoline (E10)<sup>11</sup> ICE GTDI (e.g., EcoBoost)<sup>13</sup></b>	~480 miles/tank
<b>Diesel ICE</b>	~600 miles/tank
<b>Gasoline Hybrid<sup>14</sup></b>	~500 miles/tank
<b>PHEV with 28 mile all-electric driving range – U.S. Average</b>	~500 miles on combined gas and electric power; more than 1,200 miles between visits to a gas station in typical use
<b>PHEV with 28 mile all-electric driving range – California Average<sup>15</sup></b>	
<b>PHEV with 28 mile all-electric driving range – Minnesota Average<sup>16</sup></b>	
<b>BEV with 70 mile single-charge driving range – U.S. Average</b>	Up to 70 miles on a charge
<b>BEV with 70 mile single-charge driving range – California Average<sup>15</sup></b>	
<b>BEV with 70 mile single-charge driving range – Minnesota Average<sup>16</sup></b>	

## Fueling/charging time

<b>Gasoline (E10)<sup>11</sup> ICE</b>	Minutes
<b>Gasoline (E10)<sup>11</sup> ICE with Auto Start-Stop<sup>12</sup></b>	Minutes
<b>Gasoline (E10)<sup>11</sup> ICE GTDI (e.g., EcoBoost)<sup>13</sup></b>	Minutes
<b>Diesel ICE</b>	Minutes
<b>Gasoline Hybrid<sup>14</sup></b>	Minutes

<b>PHEV</b> with 28 mile all-electric driving range – U.S. Average	Minutes for gasoline; 2.5 hours with a 240V outlet and 7 hours with a 120V outlet
<b>PHEV</b> with 28 mile all-electric driving range – California Average <sup>15</sup>	
<b>PHEV</b> with 28 mile all-electric driving range – Minnesota Average <sup>16</sup>	
<b>BEV</b> with 70 mile single-charge driving range – U.S. Average	Up to 4 hours with a 240V outlet if equipped with a 6.6kW charge port
<b>BEV</b> with 70 mile single-charge driving range – California Average <sup>15</sup>	
<b>BEV</b> with 70 mile single-charge driving range – Minnesota Average <sup>16</sup>	

## CO<sub>2</sub> emissions

	Total life cycle CO <sub>2</sub> (metric tons)
<b>Gasoline (E10)</b> <sup>11</sup> <b>ICE</b>	74
<b>Gasoline (E10)</b> <sup>11</sup> <b>ICE</b> with Auto Start-Stop <sup>12</sup>	72
<b>Gasoline (E10)</b> <sup>11</sup> <b>ICE</b> GTDI (e.g., EcoBoost) <sup>13</sup>	70
<b>Diesel ICE</b>	66
<b>Gasoline Hybrid</b> <sup>14</sup>	55
<b>PHEV</b> with 28 mile all-electric driving range – U.S. Average	53
<b>PHEV</b> with 28 mile all-electric driving range – California Average <sup>15</sup>	42
<b>PHEV</b> with 28 mile all-electric driving range – Minnesota Average <sup>16</sup>	58
<b>BEV</b> with 70 mile single-charge driving range – U.S. Average	58
<b>BEV</b> with 70 mile single-charge driving range – California Average <sup>15</sup>	33
<b>BEV</b> with 70 mile single-charge driving range – Minnesota Average <sup>16</sup>	67

## Well to tank <sup>5</sup>

<b>Gasoline (E10)</b> <sup>11</sup> <b>ICE</b>	~60 g/km
<b>Gasoline (E10)</b> <sup>11</sup> <b>ICE</b> with Auto Start-Stop <sup>12</sup>	~60 g/km
<b>Gasoline (E10)</b> <sup>11</sup> <b>ICE</b> GTDI (e.g., EcoBoost) <sup>13</sup>	~55 g/km
<b>Diesel ICE</b>	~45 g/km
<b>Gasoline Hybrid</b> <sup>14</sup>	~45 g/km
<b>PHEV</b> with 28 mile all-electric driving range – U.S. Average	~45 g/km <sup>23</sup>
<b>PHEV</b> with 28 mile all-electric driving range – California Average <sup>15</sup>	
<b>PHEV</b> with 28 mile all-electric driving range – Minnesota Average <sup>16</sup>	

BEV with 70 mile single-charge driving range - U.S. Average n/a

BEV with 70 mile single-charge driving range - California Average <sup>15</sup>

BEV with 70 mile single-charge driving range - Minnesota Average <sup>16</sup>

## Tank to wheels <sup>6</sup>

Gasoline (E10) <sup>11</sup> ICE ~195 g/km

Gasoline (E10) <sup>11</sup> ICE with Auto Start-Stop <sup>12</sup> ~190 g/km

Gasoline (E10) <sup>11</sup> ICE GTDI (e.g., EcoBoost) <sup>13</sup> ~185 g/km

Diesel ICE ~185 g/km

Gasoline Hybrid <sup>14</sup> ~135 g/km

PHEV with 28 mile all-electric driving range - U.S. Average ~140 g/km

PHEV with 28 mile all-electric driving range - California Average <sup>15</sup>

PHEV with 28 mile all-electric driving range - Minnesota Average <sup>16</sup>

BEV with 70 mile single-charge driving range - U.S. Average n/a

BEV with 70 mile single-charge driving range - California Average <sup>15</sup>

BEV with 70 mile single-charge driving range - Minnesota Average <sup>16</sup>

## Electricity generation <sup>7</sup>

Gasoline (E10) <sup>11</sup> ICE n/a

Gasoline (E10) <sup>11</sup> ICE with Auto Start-Stop <sup>12</sup> n/a

Gasoline (E10) <sup>11</sup> ICE GTDI (e.g., EcoBoost) <sup>13</sup> n/a

Diesel ICE n/a

Gasoline Hybrid <sup>14</sup> n/a

PHEV with 28 mile all-electric driving range - U.S. Average ~160 g/km

PHEV with 28 mile all-electric driving range - California Average <sup>15</sup> ~75 g/km

PHEV with 28 mile all-electric driving range - Minnesota Average <sup>16</sup> ~195 g/km

BEV with 70 mile single-charge driving range - U.S. Average ~175 g/km

BEV with 70 mile single-charge driving range - California Average <sup>15</sup> ~80 g/km

BEV with 70 mile single-charge driving range - Minnesota Average <sup>16</sup> ~210 g/km

## Vehicle operation <sup>8</sup>

	Total life cycle CO <sub>2</sub> emissions	Vehicle operation as a percent of total life cycle CO <sub>2</sub> emissions
<b>Gasoline (E10)<sup>11</sup> ICE</b>	~255 g/km	89%
<b>Gasoline (E10)<sup>11</sup> ICE with Auto Start-Stop<sup>12</sup></b>	~250 g/km	89%
<b>Gasoline (E10)<sup>11</sup> ICE GTDI (e.g., EcoBoost)<sup>13</sup></b>	~240 g/km	89%
<b>Diesel ICE</b>	~230 g/km	88%
<b>Gasoline Hybrid<sup>14</sup></b>	~180 g/km	85%
<b>PHEV with 28 mile all-electric driving range – U.S. Average</b>	~170 g/km <sup>18</sup>	82%
<b>PHEV with 28 mile all-electric driving range – California Average<sup>15</sup></b>	~130 g/km <sup>18</sup>	77%
<b>PHEV with 28 mile all-electric driving range – Minnesota Average<sup>16</sup></b>	~190 g/km <sup>18</sup>	83%
<b>BEV with 70 mile single-charge driving range – U.S. Average</b>	~175 g/km	78%
<b>BEV with 70 mile single-charge driving range – California Average<sup>15</sup></b>	~80 g/km <sup>15</sup>	61%
<b>BEV with 70 mile single-charge driving range – Minnesota Average<sup>16</sup></b>	~210 g/km <sup>16</sup>	81%

## Materials, assembly, disposal<sup>9</sup>

<b>Gasoline (E10)<sup>11</sup> ICE</b>	~30 g/km
<b>Gasoline (E10)<sup>11</sup> ICE with Auto Start-Stop<sup>12</sup></b>	~30 g/km
<b>Gasoline (E10)<sup>11</sup> ICE GTDI (e.g., EcoBoost)<sup>13</sup></b>	~30 g/km
<b>Diesel ICE</b>	~30 g/km
<b>Gasoline Hybrid<sup>14</sup></b>	~35 g/km
<b>PHEV with 28 mile all-electric driving range – U.S. Average</b>	~40 g/km
<b>PHEV with 28 mile all-electric driving range – California Average<sup>15</sup></b>	
<b>PHEV with 28 mile all-electric driving range – Minnesota Average<sup>16</sup></b>	
<b>BEV with 70 mile single-charge driving range – U.S. Average</b>	~50 g/km
<b>BEV with 70 mile single-charge driving range – California Average<sup>15</sup></b>	
<b>BEV with 70 mile single-charge driving range – Minnesota Average<sup>16</sup></b>	

## Annual fuel cost

<b>Gasoline (E10)<sup>11</sup> ICE</b>	~\$1,400–\$2,300 <sup>19</sup>
<b>Gasoline (E10)<sup>11</sup> ICE with Auto Start-Stop<sup>12</sup></b>	~\$1,300–\$2,200 <sup>20</sup>

<b>Gasoline (E10)</b> ICE GTDI (e.g., EcoBoost)	~\$1,300–\$2,100
<b>Diesel ICE</b>	~\$1,000–\$1,700 <sup>22</sup>
<b>Gasoline Hybrid</b> <sup>14</sup>	~\$1,000–\$1,600 <sup>23</sup>
<b>PHEV</b> with 28 mile all-electric driving range – U.S. Average	~\$750–\$1,050 (\$500–800 for gasoline + \$250 for electricity) <sup>24</sup>
<b>PHEV</b> with 28 mile all-electric driving range – California Average <sup>15</sup>	
<b>PHEV</b> with 28 mile all-electric driving range – Minnesota Average <sup>16</sup>	
<b>BEV</b> with 70 mile single-charge driving range – U.S. Average	~\$550 <sup>25</sup>
<b>BEV</b> with 70 mile single-charge driving range – California Average <sup>15</sup>	
<b>BEV</b> with 70 mile single-charge driving range – Minnesota Average <sup>16</sup>	

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.
2. Cradle to Grave Lifecycle Analysis of Vehicle and Fuel Pathways. DOE Hydrogen and Fuel Cells Program Record #14006. (2014) [http://www.hydrogen.energy.gov/pdfs/14006\\_cradle\\_to\\_grave\\_analysis.pdf](http://www.hydrogen.energy.gov/pdfs/14006_cradle_to_grave_analysis.pdf) (pdf, 1Mb)
3. Fuel economy estimates are from the U.S. Department of Energy's Cradle-to-Grave (C2G) study [http://www.hydrogen.energy.gov/pdfs/14006\\_cradle\\_to\\_grave\\_analysis.pdf](http://www.hydrogen.energy.gov/pdfs/14006_cradle_to_grave_analysis.pdf) (pdf, 1Mb). Vehicle fuel economies and component sizes were estimated by Argonne National Lab's vehicle simulation tool, Autonomie, using a consistent set of vehicle performance criteria across fuel-vehicle combinations. Each vehicle is presumed to be optimized for the fuel on which it operates. Inputs to Autonomie were based on vehicle manufacturers' information and ANL assumptions. Fuel economy from the test cycles was adjusted to estimate "on-road," real-world fuel economy using the U.S. Environmental Protection Agency's formulas and methodology.
4. C2G assumes a 17-gallon tank for the gasoline and diesel ICE vehicles and a 13-gallon tank for the HEV and PHEV; the BEV has no fuel tank.
5. Well-to-tank emissions represent the CO<sub>2</sub> generated by excavating feedstocks and producing and distributing the fuel.
6. Tank-to-wheels emissions represent the CO<sub>2</sub> generated by burning the fuel in the vehicle.
7. Electricity generation represents the CO<sub>2</sub> emitted by excavating feedstocks and generating and transmitting electricity, on average for the U.S. grid.
8. Vehicle operation CO<sub>2</sub> is the sum of the well-to-tank, tank-to-wheels and electricity generation emissions. The PHEV total CO<sub>2</sub> emissions are weighted by the share of miles traveled in electric and gasoline modes.
9. Materials, assembly and disposal data are from the C2G study, based on 160,000 miles (256,000 km) lifetime travel.
10. (g/km: Vehicle operation + Materials, Assembly, Disposal) \* 256,000 km / 1,000,000 = metric tons
11. Gasoline is assumed to be 10 percent ethanol by volume.
12. In a vehicle with start-stop technology the engine shuts off when the vehicle is stopped, for example, at a traffic light. This technology was not considered in the U.S. Department of Energy C2G study report. We assume a 3 percent fuel economy benefit based on data from the 2013 model year Ford Fusion.
13. A gasoline turbo-charged direct injection (GTDI – the technology used in Ford's EcoBoost engines) engine was not considered in the C2G study report. We assume a 7 percent fuel economy benefit based on data from the 2013 model year Ford Fusion.
14. In general, HEVs deliver approximately 40–50 percent better fuel economy than comparably sized non-hybrids.
15. Assume a Ford Focus-sized diesel at 41 mpg. C2G provides only the U.S. average electric grid CO<sub>2</sub> impact. This California electric grid assumes 11.3 percent coal, 30.2 percent natural gas, 0.1 percent oil, 21.2 percent nuclear, 0.8 percent biomass and 36.5 percent renewables.
16. C2G provides only the U.S. average electric grid CO<sub>2</sub> impact. This Minnesota electric grid assumes 71.5 percent coal, 0.8 percent natural gas, 0.3 percent oil, 14.1 percent nuclear, 0.0 percent biomass and 13.3

percent renewables.

17. Mpg, or miles per gallon equivalent, for electric vehicles is calculated based on the 33.7 kWh energy content of a gallon of gasoline.
18. Total CO<sub>2</sub> for the PHEV assumes an all-electric range of 28 miles and a utility factor of 50 percent (SAE J2841). The utility factor indicates the percentage of distance the vehicle is driven using electricity.
19. Based on 12,000 miles/year, 26 mpg and \$3-5/gallon.
20. Based on 12,000 miles/year, 27 mpg and \$3-5/gallon.
21. Based on 12,000 miles/year, 28 mpg and \$3-5/gallon.
22. Based on 12,000 miles/year, 35 mpg and \$3-5/gallon.
23. Based on 12,000 miles/year, 37 mpg and \$3-5/gallon.
24. Based on 12,000 miles/year, 50 percent in electric mode at 2.9 miles/kWh (35 kWh/100 miles, combined) and 12 cents/kWh, and 50 percent in gasoline-engine mode at 36 mpg and \$3-5/gallon.
25. Based on 12,000 miles/year, 2.6 miles/kWh (EPA 32 kWh/100 miles, combined) and 12 cents/kWh.

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## Climate Change and Environment

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# Applying Life Cycle Assessment

We are applying the knowledge gained through life cycle assessment in real-world product development decisions and in tools that help our customers choose more sustainable products.

## Improving Our Products with the Product Sustainability Index

Our Product Sustainability Index (PSI) represents one of our most advanced applications of life cycle assessment in product development decisions. This tool, which has been used in our European product development operations for more than a decade, helps us to assess and find opportunities to reduce the impacts of our products over their entire life cycle – including environmental impacts such as global warming from greenhouse gas (GHG) emissions, societal questions such as pedestrian protection and economic issues such as cost of ownership.

Ford's PSI tracks eight product attributes identified as key sustainability elements of a vehicle: life cycle global warming potential; life cycle air-quality potential (air pollutants); the use of sustainable materials (recycled and renewable materials); vehicle interior air quality; exterior noise impact (drive-by noise); safety, as measured by the European New Car Assessment Program (including for occupants and also 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).

Since 2002 we have been applying the PSI as a sustainability management tool in the development of all of our major new European vehicles. 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 with the previous models. The chart below shows specific performance and areas of improvement for each model. A detailed report on the PSI methodology can be [downloaded from in this sustainability report](#).

**PSI Assessed Model Performance**

**Life Cycle Global Warming**

Method

Emissions of carbon dioxide (CO<sub>2</sub>) and other greenhouse gases from raw material extraction to material, part and vehicle production, driving period (150,000 km, including air conditioning) and final recycling/recovery (i.e., full vehicle life cycle, cradle-to-cradle)

	Performance*	Better/Worse than Previous Model
<b>2013 Ford Focus, 1.6L TDCi ECONetic</b>	23 metric tons	Better

	CO <sub>2</sub> e	
<b>2013 Ford Focus, 1.0L EcoBoost® Petrol</b>	27 metric tons CO <sub>2</sub> e	No previous model
<b>2013 Ford Focus Electric</b>	33 metric tons CO <sub>2</sub> e	No previous model
<b>2013 Ford Focus Electric (with recommended electricity)</b>	12 metric tons CO <sub>2</sub> e	No previous model
<b>2011 Ford Focus, 1.6L Gasoline</b>	32 metric tons CO <sub>2</sub> e	Better
<b>2011 Ford Focus, 1.6L Diesel</b>	27 metric tons CO <sub>2</sub> e	Better
<b>2009 Ford Fiesta ECONetic, Diesel</b>	21 metric tons CO <sub>2</sub> e	Better
<b>2009 Ford Fiesta, Gasoline</b>	30 metric tons CO <sub>2</sub> e	Better

\*1 metric ton = 1,000 kg

## Life Cycle Air Quality

### Method

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

	Performance	Better/Worse than Previous Model
<b>2013 Ford Focus, 1.6L TDCi ECONetic</b>	21 kg ethene equivalent	Better
<b>2013 Ford Focus, 1.0L EcoBoost® Petrol</b>	26 kg ethene equivalent	No previous model
<b>2013 Ford Focus Electric</b>	8 kg ethene equivalent	No previous model
<b>2013 Ford Focus Electric (with recommended electricity)</b>	5 kg ethene equivalent	No previous model
<b>2011 Ford Focus, 1.6L Gasoline</b>	30 kg ethene equivalent	Better
<b>2011 Ford Focus, 1.6L Diesel</b>	25 kg ethene equivalent	Better
<b>2009 Ford Fiesta ECONetic, Diesel</b>	22 kg ethene equivalent	Better
<b>2009 Ford Fiesta, Gasoline</b>	32 kg ethene equivalent	Better

## Sustainable Materials

### Method

Use of recycled and natural materials

	Performance	Better/Worse than Previous Model
<b>2013 Ford Focus, 1.6L TDCi ECONetic</b>	5.3% of non-	Better

	metals	
<b>2013 Ford Focus, 1.0L EcoBoost Petrol</b>	5.4% of non-metals	No previous model
<b>2013 Ford Focus Electric</b>	5.3% of non-metals	No previous model
<b>2013 Ford Focus Electric (with recommended electricity)</b>	5.3% of non-metals	No previous model
<b>2009 Ford Fiesta ECONetic, Diesel</b>	8.5% of non-metals	Better
<b>2009 Ford Fiesta, Gasoline</b>	9% of non-metals	Better

## Substance Management

	Performance	Better/Worse than Previous Model
<b>2013 Ford Focus, 1.6L TDCi ECONetic</b>	Designed against rigorous standards based on certified processes	Better
<b>2013 Ford Focus, 1.0L EcoBoost® Petrol</b>	Designed against rigorous standards based on certified processes	No previous model
<b>2013 Ford Focus Electric</b>	Designed against rigorous standards based on certified processes	No previous model
<b>2013 Ford Focus Electric (with recommended electricity)</b>	Designed against rigorous standards based on certified processes	No previous model
<b>2009 Ford Fiesta ECONetic, Diesel</b>	Substance management	Better
<b>2009 Ford Fiesta, Gasoline</b>	Substance management	Better

## Drive-by Noise

Method

Decibel level weighted to human ear dB(A)

	Performance	Better/Worse than Previous Model
<b>2013 Ford Focus, 1.6L TDCi ECONetic</b>	68 dB(A)	Better
<b>2013 Ford Focus, 1.0L EcoBoost® Petrol</b>	66 dB(A)	No previous model
<b>2013 Ford Focus Electric</b>	69.7 dB(A)	No previous model
<b>2013 Ford Focus Electric (with recommended electricity)</b>	69.7 dB(A)	No previous model
<b>2011 Ford Focus, 1.6L Gasoline</b>	66 dB(A)	Better
<b>2011 Ford Focus, 1.6L Diesel</b>	68 dB(A)	Better
<b>2009 Ford Fiesta ECONetic, Diesel</b>	69 dB(A)	Better
<b>2009 Ford Fiesta, Gasoline</b>	72 dB(A)	Similar

## Euro NCAP (independent safety rating)

Method

Complex method, structural stability, occupant safety, and pedestrian safety; active safety elements, etc., including European New Car Assessment Program (Euro NCAP) stars

	Performance	Better/Worse than Previous Model
<b>2013 Ford Focus, 1.6L TDCi ECONetic</b>	5-star overall safety rating	Better
<b>2013 Ford Focus, 1.0L EcoBoost® Petrol</b>	5-star overall safety rating	No previous model
<b>2013 Ford Focus Electric</b>	Not tested	No previous model
<b>2013 Ford Focus Electric (with recommended electricity)</b>	Not tested	No previous model
<b>2011 Ford Focus, Gasoline and Diesel</b>	5-star overall safety rating, plus 4 Euro NCAP Advanced rewards for Active City Stop, Lane Keeping Aid, Forward Alert and Driver Alert	Better
<b>2009 Ford Fiesta ECONetic, Diesel</b>	5-star Euro NCAP rating for adult occupant safety; electronic stability control available for all versions	Better
<b>2009 Ford Fiesta, Gasoline</b>	5-star Euro NCAP rating for adult occupant safety; electronic stability control available for all versions	Better

## Mobility Capability

### Method

Mobility service (including seats, luggage) to vehicle size; measured as vehicle shadow in m<sup>2</sup> and luggage areas in liters

	Performance	Better/Worse than Previous Model
<b>2013 Ford Focus, 1.6L TDCi ECONetic</b>	8.76 m <sup>2</sup> shadow area, 363 liter luggage compartment	Better
<b>2013 Ford Focus, 1.0L EcoBoost® Petrol</b>	8.76 m <sup>2</sup> shadow area, 363 liter luggage compartment	No previous model
<b>2013 Ford Focus Electric</b>	8.76 m <sup>2</sup> shadow area, 237 liter luggage compartment	No previous model
<b>2013 Ford Focus Electric (with recommended electricity)</b>	8.76 m <sup>2</sup> shadow area, 237 liter luggage compartment	No previous model
<b>2011 Ford Focus, Gasoline and Diesel</b>	8.76 m <sup>2</sup> shadow area, 363 liter luggage compartment	Similar
<b>2009 Ford Fiesta ECONetic, Diesel</b>	7.5 m <sup>2</sup> shadow area, 295 liter luggage compartment	Better
<b>2009 Ford Fiesta, Gasoline</b>	7.5 m <sup>2</sup> shadow area, 295 liter luggage compartment	Similar

## Life Cycle Cost\*

### Method

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

	Performance	Better/Worse than Previous Model
<b>2013 Ford Focus, 1.6L TDCi ECONetic</b>	Approx. €16,000	Better
<b>2013 Ford Focus, 1.0L EcoBoost® Petrol</b>	Approx. €15,000	No previous model
<b>2013 Ford Focus Electric</b>	Approx. €25,000	No previous model
<b>2013 Ford Focus Electric (with recommended electricity)</b>	Approx. €25,500	No previous model
<b>2011 Ford Focus, 1.6L Gasoline</b>	Approx. €16,400	Better
<b>2011 Ford Focus, 1.6L Diesel</b>	Approx. €16,700	Better
<b>2009 Ford Fiesta ECONetic, Diesel</b>	Approx. €13,000	Similar
<b>2009 Ford Fiesta, Petrol</b>	Approx. €11,000	Better

\*No guarantee that the costs reflect market conditions (in particular dependent on assumed differences in residual value and running cost).

Both Ford's own internal assessments and external assessments have found the PSI to be an effective life cycle assessment and design tool. An external study, conducted by experts in 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.

## Comparing Material Choices with Life Cycle Assessment

We use life cycle assessment to help us assess the environmental and cost impacts of different vehicle material choices. For example, we evaluated the relative benefits of using soy-based foam compared with traditional petroleum-based foams and found a net decrease of 5.5 pounds of CO<sub>2</sub>eq. per pound of soy oil used over the life cycle of the vehicle. We now use soy-based foam in all of our vehicles in North America. In collaboration with the University of Michigan's Center for Sustainable Systems, we have developed a life cycle assessment tool to understand the potential benefits and trade-offs of using bio-based composite materials in automotive components. We have used this life-cycle-based material selection tool to evaluate a cellulose-reinforced polypropylene composite used in grill shutter housings and found that it has overall advantages in energy and global warming impacts compared with the glass-fiber reinforced composite.

Also see:

> [Choosing More Sustainable Materials](#)

Life cycle assessment also underpinned our decision to dramatically increase the amount of aluminum and high-strength steel used in the 2015 Ford F-150. Our studies show that using more aluminum, high-strength steel and other lightweight materials lowers the vehicles' life cycle GHG emissions. Though the energy required to make these materials can be higher than the energy needed to produce the conventional steel that is typically

used, the increase in GHG emissions resulting from production-related energy use is more than offset by the GHG savings from reducing vehicle weight and thereby improving vehicle fuel efficiency. We also found that lightweighting has the most life cycle GHG benefits on larger, heavier and more powerful vehicles. The use of aluminum and high-strength steel in the 2015 F-150 also makes the truck stronger, more durable and more capable than any previous F-150.

Also see:

[Spotlight: Reinventing the Ford F-150](#)

## Helping Fleet Customers with Sustainability Analysis Tools

In 2012, we launched a suite of tools to help fleet customers compare the sustainability, costs and benefits of the different vehicle technology and alternative fuel options available in today's marketplace. The toolkit allows fleet customers to assess the CO<sub>2</sub> footprint of their existing vehicle fleet and make side-by-side comparisons of emissions and fuel costs for different vehicle types, powertrain options, fuel options and personalized user criteria such as local fuel costs, regional and local electricity sources, and driving cycles.

Based on this information, the calculator tool helps a customer assess the relative emissions and cost benefits of different vehicle options. For example, for a customer deciding the best location to add electric vehicles to his or her fleet, the calculator shows that the Focus Electric emits about 70 g CO<sub>2</sub>/km using electricity from the California grid but more than twice as much, about 150 g CO<sub>2</sub>/km, in the more coal-intensive Southeast U.S. The calculator enables our fleet customers to both save money and protect the environment. For more information on this suite of tools, please see the [Driver](#) section of Vehicle Fuel Efficiency and CO<sub>2</sub> Emissions Progress and Performance.

### READ MORE:

*We consider the impacts of materials at every stage of a vehicle's life cycle.*

> [Sustainable Materials](#)

*We are making progress on our vehicle CO<sub>2</sub> reduction goals in all of our regions.*

> [Vehicle Fuel Efficiency and CO<sub>2</sub> Emissions Progress and Performance](#)



*The new F-150 is Ford's toughest, most capable – and most sustainable – truck ever.*

[Spotlight: Reinventing the Ford F-150](#)

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# Sustainable Technologies and Alternative Fuels Plan

In 2007, Ford set out an ambitious plan of vehicle technology and alternative powertrain and fuel actions to meet our [climate stabilization goals](#). For the past eight years, we have consistently implemented this plan, delivering significant improvements in the fuel economy of our global product portfolio and enabling the use of alternative fuels.

We are taking a portfolio approach to reducing vehicle carbon dioxide (CO<sub>2</sub>) emissions and improving fuel efficiency. Our goal is to provide diversity in fueling options in order to meet customers' differing needs while improving vehicle energy efficiency and long-term sustainability. We are implementing a range of technologies to improve the fuel efficiency of traditional gasoline- and diesel-powered vehicles. And, we are implementing alternatively fueled vehicles and alternative powertrains, including biofuel vehicles and electrified vehicles.

*Our goal is to provide diversity in fueling options while improving vehicle energy efficiency and long-term sustainability.*

Also see:

- [> Vehicle Fuel Efficiency and CO<sub>2</sub> Emissions Progress and Performance](#)

## What We're Doing



Though the fuel economy of modern vehicles has improved significantly over the past few decades, we continue to pursue opportunities to further improve vehicles with conventional gasoline and diesel powertrains. We are implementing a range of advanced engine and transmission technologies as well as improving aerodynamics and reducing weight.

- [> Improving Fuel Economy](#)



Alternative fuels and powertrains are playing a growing role in reducing carbon emissions. We now offer a range of alternatives to conventional internal combustion vehicles, including electrified vehicles – hybrids, plug-in hybrids and all-electric vehicles – as well as vehicles that run on clean diesel, renewable biofuels, natural gas and propane. We are also working to advance hydrogen fuel cell vehicle technologies.

- [> Migration to Alternative Fuels and Powertrains](#)

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# Improving Fuel Economy

We are using a variety of technologies to improve the fuel economy of traditional gas and diesel engines. These include advanced engine and transmission technologies, weight reductions and improvements to vehicle subsystems.



*We've reduced the weight of the 2015 Ford F-150 by approximately 700 pounds by using high-strength steels and aluminum alloys.*



*We are developing nine- and 10-speed transmissions that will improve fuel economy by up to 5 percent over six-speed gear boxes.*



*Electric Power-Assisted Steering (EPAS) can reduce fuel consumption and decrease CO<sub>2</sub> emissions by up to 3.5 percent over traditional hydraulic systems.*

- Choose a technology:
- EcoBoost®
  - Advanced Transmissions
  - Electric Power-Assisted Steering
  - Auto Start-Stop
  - Aggressive Deceleration Fuel Shut-Off
  - Active Grille Shutter
  - Battery Management Systems
  - Weight Reductions
  - Smaller Vehicles

## EcoBoost®



*EcoBoost engines deliver significant vehicle fuel-efficiency gains and CO<sub>2</sub> reductions.*

### Technology Overview and Benefits

The centerpiece of our fuel-economy improvement efforts for gasoline-powered vehicles is the EcoBoost engine, which uses turbocharging and direct fuel injection along with reduced displacement to deliver significant vehicle fuel-efficiency gains and CO<sub>2</sub> reductions, relative to larger displacement engines, without sacrificing vehicle performance.

Due to its compatibility with most of the gasoline-powered vehicles we produce, we are able to offer EcoBoost's fuel-economy benefits throughout our product lineup. Our rapid deployment of EcoBoost in high volumes across a wide array of our vehicle nameplates is helping us make a significant step forward in CO<sub>2</sub> emission reductions.

## Deployment

Ford initially introduced the EcoBoost engine in 2009. Since then we have produced more than 5 million EcoBoost-equipped vehicles globally, responding to strong consumer demand for the technology. The engine is now available on 100 percent of our North American nameplates and nearly 80 percent of our European nameplates. EcoBoost engines are now available in every one of our operating regions.

All told, we have introduced or announced seven EcoBoost engine displacements with multiple derivatives for specific vehicles and markets. And, we offer EcoBoost engines on 32 different vehicles across all of our operating regions. Our EcoBoost engine offerings range in size from a 1.0L I-3 to a 3.5L V6.

As EcoBoost is a key element of our long-term powertrain strategy, we will continue to improve its efficiency and vehicle application potential through the further development of supporting advanced technologies.



## Advanced Transmissions



*Nine- and 10-speed transmissions are projected to improve fuel economy by up to 5 percent over six-speed gear boxes.*

## Technology Overview

We have adopted fuel-efficient six-speed transmissions across our product portfolio. We continue to improve the performance and efficiency of all our transmissions through powertrain matching optimization and reducing parasitic losses due to mechanical friction and hydraulics. We are also evaluating more advanced transmission concepts to support additional vehicle fuel-efficiency and performance improvements. In 2013 we began developing an all-new generation of advanced-technology nine- and 10-speed automatic transmissions for cars, crossovers, SUVs and trucks, in partnership with General Motors.

## Benefits

The nine- and 10-speed transmissions we are developing are projected to improve fuel economy by up to 5 percent over six-speed gear boxes, depending on the application. In addition, they provide better acceleration, smoother shifting and a quieter driving experience.

## Deployment

We have completed our migration to six-speed gearboxes in North America and Europe. We plan to start deploying the next-generation nine- and 10-speed transmissions worldwide within the next few years.



## Electric Power-Assisted Steering



*EPAS typically helps reduce fuel consumption and decrease CO<sub>2</sub> emissions by up to 3.5 percent over traditional hydraulic systems.*

### Technology Overview

Electric power-assisted steering (EPAS) uses a small electric motor instead of conventional hydraulic systems to assist steering.

### Benefits

EPAS typically helps reduce fuel consumption and decrease CO<sub>2</sub> emissions by up to 3.5 percent over traditional hydraulic systems, depending on the vehicle and powertrain application. EPAS also enables other advanced technologies, such as Active Park Assist, which helps drivers to parallel park, and “pull drift” compensation, which detects road conditions – such as crowned road surfaces or crosswinds – and adjusts the EPAS steering system to help the driver compensate for pulling and drifting.

### Deployment

The majority of our Ford and Lincoln vehicles in the North American and European markets come equipped with EPAS, and this technology is also used in all of our new electrified vehicles.



## Auto Start-Stop



*Auto Start-Stop improves vehicle fuel economy by 3.5 percent on average.*

## Technology Overview

Auto Start-Stop technology turns off the engine when the vehicle is stopped and automatically restarts it when the driver commands acceleration to resume driving. Auto Start-Stop includes sensors that monitor specific functions, such as cabin temperature, power supply state and steering input. The engine will automatically restart if any of these functions fall below a certain level, thereby preventing conditions that could adversely impact drivability and/or occupant comfort.

## Benefits

Auto Start-Stop is seamless to the driver, and saves the fuel typically wasted when a car is stopped and running at idle. Fuel savings vary depending on driving patterns. On average, Auto Start-Stop improves vehicle fuel economy by 3.5 percent, but its benefit is more significant in city driving. The technology also reduces tailpipe emissions to zero while the vehicle is stationary – for example, when waiting at a stoplight.

## Deployment

In the U.S., we offer Auto Start-Stop on specific EcoBoost engine versions of the Ford Fusion and Focus and the 2015 Ford F-150. In Europe, Start-Stop is already standard on the Ford Ka and certain versions of the Mondeo, S-MAX, Galaxy, Focus, C-MAX and Grand C-MAX. By 2016, 90 percent of our global vehicle nameplates will be available with Auto Start-Stop.



## Aggressive Deceleration Fuel Shut-Off



*ADFSO technology is a standard feature in all of our North American vehicles.*

## Technology Overview

Aggressive Deceleration Fuel Shut-Off (ADFSO) allows fuel supply to the engine to be shut off during vehicle deceleration and then automatically restarted when needed for acceleration or when the vehicle's speed approaches zero. This advancement builds on the Deceleration Fuel Shut-Off technology available in our existing vehicles by extending the fuel shutoff to lower speeds and more types of common driving conditions, without compromising driving performance or emissions.

## Benefits

This improved fuel shutoff technology increases fuel economy by an average of 1 percent. An additional benefit is increased deceleration rates, which

should extend brake life and improve speed control on undulating roads.

## Deployment

ADFSO technology is a standard feature in all of our North American vehicles, and we will continue to expand its implementation globally.



## Active Grille Shutter



*Active Grille Shutter increases fuel economy and reduces CO<sub>2</sub> emissions by up to 2 percent.*

## Technology Overview and Benefits

Active Grille Shutter technology is one of our key aerodynamic improvements. When fully closed, the technology reduces aerodynamic drag by up to 6 percent, increasing fuel economy and reducing CO<sub>2</sub> emissions by up to 2 percent.

## Deployment

Active Grille Shutter technology was first implemented on our European vehicles. Since then, this technology has been adopted onto the majority of our products globally, including the 2015 Ford F-150 and the 2015 Mustang in the U.S.



## Battery Management Systems



*BMS has already been launched globally on a majority of our vehicle platforms.*

## Technology Overview and Benefits

By reducing vehicle electrical loads and increasing the efficiency of a

vehicle's electrical power generation system, we can improve fuel efficiency. Our Battery Management Systems (BMS), for example, control the power supply system (in particular the alternator) to maximize the overall efficiency of the electrical system and reduce its negative impacts on fuel economy. This is accomplished by maximizing electricity generation during the most fuel-efficient situations, such as vehicle deceleration. In less fuel-efficient situations, the alternator's electricity generation is minimized to conserve fuel.

## Deployment

BMS has already been launched globally on a majority of our vehicle platforms. We will continue to implement BMS on our remaining vehicles and will continue to optimize its functionality to further improve benefits. We have also introduced more efficient alternators, which improve fuel economy.



## Weight Reductions

### Ford Lightweight Concept Car Reduces Vehicle Weight by More Than 800 pounds, or 23 percent



In 2014, we revealed a lightweight concept car that reduced weight by more than 800 pounds, or 23 percent, compared to the 2013 Ford Fusion on which it was based. The vehicle used multiple commercially available materials and production processes to accomplish this, including replacing steel with aluminum, magnesium and carbon fiber composites. Ford engineers took a holistic approach to weight reduction by incorporating advanced materials into the entire design of the vehicle, including the powertrain, chassis, body, electrical systems and interior features such as seats. Vehicle weight savings enabled the use of a 1.0L three-cylinder engine, rather than the 1.6L four-cylinder engine used in the original Fusion, significantly improving fuel economy and reducing CO<sub>2</sub> emissions. This vehicle demonstrates the potential of a dramatically lighter-weight vehicle that could be produced in high volumes while still providing an equivalent or improved level of safety, durability and functionality as our vehicles on the road today.

## Technology Overview

Decreasing the weight of our vehicles is an important way to improve fuel economy. We are substituting lightweight materials, such as advanced high-strength steels, aluminum, magnesium, natural fibers and nano-based materials to reduce vehicle weight. In addition, some of our advanced engines, such as EcoBoost, further reduce overall vehicle weight.

## Benefits

In general, reducing vehicle weight reduces fuel usage. To achieve our fuel-efficiency goals, we need to reduce the weight of our vehicles significantly, without compromising vehicle interior size, safety, performance or popular features. Weight reductions 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 vehicle fuel economy. But if vehicle weight can be reduced significantly, it becomes possible to downsize the powertrain required to run the vehicle. Weight reduction combined with powertrain rematching not only improves fuel economy, but helps maintain or improve overall vehicle performance (compared to a heavier vehicle with a larger engine).

Many lightweight materials also have benefits beyond fuel-efficiency gains, such as reduced waste and overall life cycle energy, along with other resources used by the vehicle.

Also see:

> [Choosing More Sustainable Materials](#)

## Deployment

The all-new 2015 Ford F-150 represents our most extensive use of lightweight materials ever. Overall, this truck is approximately 700 pounds lighter than the outgoing model, depending on the configuration, thanks to extensive use of high-strength steels and aluminum alloys. This significant weight reduction not only results in better fuel economy, it also provides the new F-150 with increased tow and payload capability, along with improved acceleration and reduced stopping distance.

To accomplish this weight reduction, we increased the use of high-strength steel in the all-new F-150 frame from 23 percent to 77 percent to create a pickup frame that is stronger, more durable and structurally more rigid than the previous generation F-150, while saving up to 60 pounds of weight. The F-150's body also uses new applications of aluminum alloys, which not only reduce weight but also improve the dent resistance and overall durability of the truck body. The specific materials used were carefully tested and analyzed based on their durability, overall performance and life cycle environmental impact.

Also see:

> [Life Cycle Assessment](#)

> [Spotlight: Reinventing the Ford F-150](#)

Other examples of our use of lighter-weight materials in a range of vehicles and parts applications, include the following:

- The Lincoln MKT crossover has an advanced lightweight magnesium and aluminum liftgate, which is more than 20 pounds, or 40 percent, lighter than a similar part made from conventional steel.
- Many of our vehicles make extensive use of high-strength steels. In the Ford Focus, for example, more than 55 percent of the vehicle shell is made from high-strength steel and more than 26 percent of the vehicle's structure is formed from ultra-high-strength boron steel.
- We are also expanding the use of aluminum engine components.

Ford researchers are also investigating and developing additional new

lightweight materials, including:

- Automotive grade carbon fiber that can be manufactured at high volume and lower cost, in partnership with DowAksa and the Institute for Advanced Composites Manufacturing Innovation
- New types of steel that are up to three times stronger than current steels and improve manufacturing feasibility with respect to part forming
- Polymeric plastic strengthening foams that are strong enough to stabilize bodywork in an accident but light enough to float on water; these foams are being used to reinforce sections of the steel auto body, such as the B-pillars
- Alternative (copper-based) wire harness technologies that will enable significant weight reductions
- 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



## Smaller Vehicles



*We are launching more small cars to provide additional fuel-efficient options.*

## Technology Overview and Benefits

Smaller, and subsequently lighter, vehicles provide consumers with another way to obtain better fuel economy.

## Deployment

We are launching more small cars to provide additional fuel-efficient options. For example, we introduced the Ford Fiesta, our global subcompact vehicle, to the U.S. In addition, we are introducing a wide range of new vehicles in the U.S. and other markets based on our global “C-car platform,” or compact sedan, including the Ford Focus and C-MAX. The Ford EcoSport compact SUV is now available in many of our major markets, including India, China, Brazil and Europe. This vehicle, which will ultimately be available in nearly 100 markets globally, is part of our global commitment to deliver fuel-efficient vehicles that customers truly want and value.

We have loaded these smaller vehicles with features and options commonly found on larger or luxury vehicles to make them attractive, thus encouraging customers to choose more fuel-efficient cars and trucks.

All of these smaller vehicles illustrate Ford's actions to provide consumers with a wider range of fuel-efficient options, as well as our efforts to leverage the best of our global products to offer new choices to customers in all of our regions worldwide.

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# Migration to Alternative Fuels and Powertrains

Only a few years back, gasoline and diesel vehicles dominated the product offerings of Ford and other automakers. That picture has changed dramatically.

We now offer electrified vehicles – including hybrid electric vehicles (HEVs), plug-in hybrid electric vehicles (PHEVs) and battery electric vehicles (BEVs) – as well as advanced clean diesel technologies and vehicles that run on renewable biofuels. And we continue our work to advance hydrogen fuel cell vehicle (FCV) technologies.



**Advanced Clean Diesel**

Modern diesels are 30 to 40 percent more fuel efficient than comparable gasoline vehicles.



**Hybrid Electric Vehicles (HEVs)**

Hybrid electric vehicles are powered by a combination of an optimized, high-efficiency internal combustion engine and an electric motor to deliver improved fuel economy.



**Battery Electric Vehicles (BEVs)**

Full electric vehicles use no gasoline; they are powered by a high-voltage electric motor and battery pack.



**Plug-in Hybrid Electric Vehicles (PHEVs)**

Plug-in hybrid electric vehicles are powered by an internal combustion engine and a high-voltage electric battery that can be charged from an electric outlet.



**Renewable Biofueled Vehicles**

Biofuels are alternative forms of gasoline and diesel made from renewable sources, usually plant materials, that offer a relatively affordable way to reduce carbon dioxide emissions.



**CNG/LPG Vehicles**

Vehicles that run on compressed natural gas (CNG) and liquefied petroleum gas (LPG – also called propane autogas) typically have lower emissions and lower fuel costs than gasoline and diesel vehicles.



 [Hydrogen Fuel Cell  
Vehicles \(FCVs\)](#)

*Hydrogen fuel cell vehicles are electric vehicles powered by hydrogen fuel cells. They emit only water vapor and heat, with no other tailpipe pollutants.*

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# Advanced Clean Diesel

Modern diesels are 30 to 40 percent more fuel efficient than comparable gasoline vehicles.



## Technology Overview and Benefits

Diesel engines are not new. However, advanced diesel technologies offer significant advantages over traditional gasoline engines and older diesel engines. They consume 30 to 40 percent less fuel than gasoline engines, and on a well-to-wheels basis they emit 15 to 30 percent less carbon dioxide (CO<sub>2</sub>).<sup>1</sup> In addition, direct-injection diesel engines provide exceptional power and torque, resulting in better driving performance and towing capability. Advanced diesel technology also dramatically reduces non-CO<sub>2</sub> tailpipe emissions such as NOx and particulate matter.



**Ford's New Full-Size Transit Van and F-650/750**

Ford offers a range of advanced diesels in Europe under the ECONetic label. In the U.S., Ford offers the 3.2L Power Stroke<sup>®</sup> turbo diesel engine in our full-size Transit van and the 6.7L V8 Power Stroke turbo diesel in the F-Series Super Duty<sup>®</sup> and F-650/F-750 medium-duty commercial trucks.

Our advanced diesel engines use a range of technologies in the engine and after-treatment systems to reduce emissions, including:

- Efficient eight-hole fuel-injector nozzles
- A diesel oxidation catalyst that converts and oxidizes hydrocarbons into water and carbon dioxide
- Selective catalytic reduction that uses an ammonia and water solution to convert the NOx in the exhaust stream into water and inert nitrogen
- A diesel particulate filter that traps any remaining soot and periodically burns it away when sensors detect that the trap is full

In 2015, we introduced a Ford-first innovation that combines the diesel oxidation catalyst and the diesel particulate filter into a single component we call a Single Brick System (SBS). This new solution improves emissions while significantly improving the packageability of the after-treatment system.

In addition, on some of our diesel engines, parasitic losses have been cut through use of low-friction piston ring coatings, advanced low-friction engine lubricants, variable-flow oil pump technology and a more-efficient vacuum pump.

## Deployment

In Europe, where diesel-powered vehicles account for more than 50 percent of new vehicle sales and make up approximately 30 percent of the total vehicle fleet on the road, Ford continues to improve its strong lineup of fuel-efficient and clean diesel vehicles. For example, we continue to introduce ECONetic versions of Ford models that deliver

improved fuel economy and emissions. The ECONetic lineup currently includes versions of the Ford Fiesta, Focus, Mondeo and Transit. Several of the ECONetic models use diesel engines, which meet the stringent Euro 5 emissions standards and emit fewer than 100 g/km of CO<sub>2</sub>. For example, the new Focus ECONetic has fuel economy of 3.4L/100 km and emits just 89 g/km of CO<sub>2</sub>.

In North America, where diesel engines are primarily used in the medium-duty truck market, Ford offers two advanced diesel engines. In 2015, we expanded the use of the 6.7L Power Stroke V8 diesel into our F-650/F-750 medium-duty products. We also introduced a diesel version of the full-size Transit van, powered by a new 3.2L Power Stroke turbo diesel engine. On both of these turbo diesel engines, the fuel system has been carefully tailored and calibrated for combustion efficiency. It enables the newest Power Stroke engine to achieve exceptional fuel-economy ratings without adversely affecting power levels.

These new diesel engines meet the U.S. Environmental Protection Agency's and California Air Resources Board's strict medium-duty chassis and heavy-duty truck emission regulations.

Our advanced diesel engines are also compatible with biodiesel, a renewable fuel made from soybean oil and other fats. All of Ford's diesel-equipped vehicles in North America are B20 compatible, meaning they can run on fuel composed of 20 percent biodiesel and 80 percent ultra-low-sulfur diesel. In Europe, our diesel vehicles are compatible with B7, and we are working with European fuel standards organizations to establish fuel-quality standards for biodiesel blends greater than B5. The use of biodiesel helps to reduce dependence on fossil fuels and reduces life cycle CO<sub>2</sub> emissions.

Also see:

> [Renewable Biofueled Vehicles](#)

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1. Figures based on J.L. Sullivan, R.E. Baker, B.A. Boyer, R.H. Hammerle, T.E. Kenney, L. Muniz, and T.J. Wallington, 2004, "CO<sub>2</sub> Emission Benefit of Diesel (versus Gasoline) Powered Vehicles," *Environmental Science and Technology*, 38: 3217-3223

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# Hybrid Electric Vehicles (HEVs)

Hybrid electric vehicles are powered by a combination of an optimized, high-efficiency internal combustion engine and an electric motor to deliver improved fuel economy.



## Technology Overview and Benefits

HEVs are powered by both an internal combustion engine and an electric motor with a battery system. The key benefit of HEVs is reduced fuel consumption: When they are powered by the electric motor and battery system only, they are not consuming gasoline. In most instances at low speeds and for short distances, Ford hybrids run exclusively on electricity. At higher speeds, and when more power is needed, the gasoline engine kicks in.



**Ford C-MAX Hybrid**

We now offer hybrid electric vehicles in North America, South America, Europe, and Asia Pacific.

All of our hybrid vehicles use Ford's Powersplit architecture, meaning they can run exclusively on battery power, exclusively on gas power, or on a combination of both to deliver the best overall vehicle fuel efficiency. Ford hybrids also feature a Regenerative Braking System. Unlike a traditional gasoline-engine vehicle in which the energy generated by braking is lost, this innovative technology enables Ford hybrids to capture braking energy and use it to help recharge the battery. All of our HEVs use advanced lithium-ion batteries.

Our current generation HEVs feature additional technology improvements, including:

- Electric motors capable of operating at higher speeds
- Optimized gear ratios, allowing for improvements in fuel economy
- More precise controls to deliver higher levels of refinement as the powertrain transitions between engine and electric drive
- Reduced weight to help increase fuel economy

They also have a suite of driver information systems to help drivers maximize fuel efficiency.

Also see:

> [Driver](#)

## Deployment

We have been offering hybrid vehicles for over a decade. Currently, in the U.S. we offer three hybrid vehicles, the Ford C-MAX Hybrid, the Ford Fusion Hybrid and the Lincoln MKZ hybrid. The Fusion is the first sedan to offer gasoline, hybrid and plug-in hybrid

powertrains, underscoring Ford's commitment to giving customers the "power of choice" in fuel-efficient technologies.

In 2014, we introduced a hybrid version of Ford Mondeo in Europe, and we already offered the Focus Electric and the C-MAX Energi in some European markets. In Asia Pacific, we offer hybrid versions of the Lincoln MKZ and Ford Fusion in South Korea, the Ford C-MAX Hybrid in Guam, and we will launch the Mondeo Hybrid in Taiwan in 2015.

We are currently increasing our hybrid volume and preparing for hybrid capability across our highest-volume global product platforms.

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# Battery Electric Vehicles (BEVs)

Full electric vehicles use no gasoline; they are powered by a high-voltage electric motor and battery pack.



## Technology Overview and Benefits

Battery electric vehicles do not have an internal combustion engine and use no on-board gasoline. Instead, they use a high-voltage electric motor, which gets its power from a high-voltage battery pack that is charged through a standard 110-volt or 220-volt outlet in the U.S., or a 230-volt outlet in Europe. The primary benefit of BEVs is that they completely eliminate carbon dioxide (CO<sub>2</sub>) and other emissions directly from the vehicle. However, they are not necessarily zero-emission over their total life cycle, as total emissions are dependent on the source of electricity used to charge their batteries. Since electricity is often cheaper than gasoline, BEVs may be less costly to operate than gasoline vehicles.



**Ford Focus Electric**

*In the U.S., Ford offers the Ford Focus Electric, which has a U.S. Environmental Protection Agency (EPA) combined fuel-economy rating of 105 miles per gallon equivalent (MPGe), a driving range of 76 miles on a charge and requires no more than four hours to charge when using a 220-volt outlet. This vehicle is also available in Europe.*

Ford's electric vehicles use lithium-ion batteries, which provide better performance, require less space and weigh less than the nickel-metal-hydrate batteries used in previous-generation hybrid electric vehicles. The Focus Electric's advanced lithium-ion battery system was engineered by Ford in cooperation with the supplier LG Chem. It uses an advanced, active-liquid cooling and heating system to precondition and regulate the temperature, which helps to maximize battery life and fuel-free driving range.

A full recharge of the Focus Electric takes just four hours at home with the 220-volt charge station. The Focus Electric also features a Regenerative Braking System, which can help maximize vehicle driving range by capturing braking energy and using it to recharge the battery. Additionally, the vehicle uses a wide range of advanced information-technology features, including an enhanced version of My Ford Touch® – our new driver interface technology – and tools for remote vehicle communications and charging.

## Deployment

We are implementing an expanded, comprehensive electric vehicle strategy aligned with growing public interest in advanced technologies that reduce the use of gasoline and diesel. The Focus Electric, our all-electric passenger sedan, is based on the global Focus platform. This car has a driving range of 76 miles on a single charge of its lithium-ion high-voltage battery and achieves an EPA-rated combined fuel efficiency of 105 MPGe. We introduced the Focus Electric in the U.S. in 2012 and in Europe in 2013.

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# Plug-in Hybrid Electric Vehicles (PHEVs)

Plug-in hybrid electric vehicles are powered by an internal combustion engine and a high-voltage electric battery that can be charged from an electric outlet. The engine and the battery work together to provide the benefits of grid-connected power and hybrid powertrain efficiency.



## Technology Overview

PHEVs are similar to HEVs in that they are equipped with both an electric battery and a gas-powered engine. Unlike HEVs, however, PHEVs are equipped with a high-capacity battery that can be charged from a private household or public electric outlet. While regular HEVs maintain a roughly constant battery charge, PHEVs discharge the battery while driving to provide additional fuel savings. PHEVs have the potential to reduce tailpipe emissions to near zero when running on battery power. When the battery is depleted, the vehicle can continue to operate on the gas-powered engine, providing significant benefits over battery electric vehicles in terms of driving range before refueling. A PHEV's overall life cycle emissions depend on the electrical power source and the usage characteristics of the vehicle. PHEVs can be significantly less expensive for consumers to operate than gasoline-powered vehicles, particularly for consumers who frequently take relatively short trips, allowing them to travel on grid-based electricity stored in batteries instead of more costly gasoline.



**Ford C-MAX Energi**

Ford offers two PHEVs in the U.S., the Ford C-MAX Energi and Fusion Energi. In 2014, the C-MAX Energi was introduced in limited European markets.

The high-voltage battery is charged through regenerative braking and discharged during acceleration events to improve the overall fuel economy of the vehicle – similar to the operation of today's conventional hybrids.

## Benefits

Overall, plugin hybrid vehicles offer several benefits, including:

- Reduced dependence on fossil fuels
- Reduced environmental impact through reductions in greenhouse gas emissions as well as smog-forming tailpipe emissions
- Potential consumer savings on energy and fuel costs

PHEV batteries can be charged at home or at other parking locations, so they might better suit those customers who do the majority of their driving in city and other urban environments, where electric battery power is the preferred powertrain alternative.

## Deployment

Ford currently offers two PHEVs in the U.S.: the Ford C-MAX Energi and Fusion Energi. In 2014, the C-MAX Energi was introduced in limited European markets.

Like Ford's HEVs, the C-MAX Energi and Fusion Energi offer a range of information-technology tools to help drivers improve fuel efficiency.

The long-term success of PHEVs (and BEVs) in the real world depends on cooperation between automakers, utilities, the government and drivers. Ford is engaged in multiple collaborative projects to help smooth the transition to electrified vehicles.

**READ MORE:**

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# Renewable Biofueled Vehicles

Biofuels are alternative forms of gasoline and diesel made from renewable sources, usually plant materials, that offer a relatively affordable way to reduce carbon dioxide emissions.



## Technology Overview

Currently, two types of biofuels are widely used: ethanol and biodiesel. Ethanol, the most common biofuel used with gasoline, is made from the fermentation of sugars, most commonly corn sugars (in the U.S. and Europe) or sugar cane (in Brazil). Biodiesel, a biofuel alternative to petroleum diesel, is made from the transesterification of vegetable oils, including soy, canola, palm and rapeseed, or animal fats. Most biodiesel in the U.S. is made from soybean oil.

Biofuels are primarily used in blends with petroleum-based fuels. Gasoline is blended with ethanol and diesel is blended with biodiesel. In the U.S., most retail market gasoline already contains up to 10 percent ethanol (referred to as E10). Certain regions offer unique blends of ethanol and gasoline, such as E85 (U.S. and Europe) and E22/E100 (Brazil). For biodiesel, the most common blend in the U.S. is 5 percent (B5) or 20 percent (B20) biodiesel, while in Europe a 7 percent biodiesel blend (B7) is most commonly used.

Most modern gasoline vehicles can run on gasoline blends up to 10 percent ethanol (E10) without any modifications, though higher blend levels of ethanol can drive engine and fuel system upgrades. Modern compression ignition engines, which are made to run on petroleum-based diesel, also require some modifications to run on biodiesel.

Ford supports the development of next-generation, or advanced, biofuels made from plant cellulose – stalks, leaves and woody matter – instead of from sugars, starches or oil seeds. Advanced biofuels have significant advantages over current corn and soy based biofuels (see Benefits and Challenges graphic below).



**Ford Galaxy**

*To date, we have introduced more than 6.4 million flexible-fuel vehicles globally. Ford is a market leader and pioneer in ethanol-based, flexible-fuel vehicles and will continue to provide a range of products that are E85-capable, aligned with infrastructure growth leading to convenient fuel accessibility and ultimately consumer demand.*

## Benefits and Challenges

Biofuels continue to be an important component of a sustainability strategy for three reasons. First, biofuels can help to address economic, social and environmental sustainability, which includes helping the industry to meet CO<sub>2</sub> emission-reduction targets. Second, the use of biofuels requires relatively modest and affordable modifications to existing vehicle and fueling technology, which makes them a viable near-term option. Third, biofuels offer synergies with other strategies. For example, the inherent high octane rating of ethanol is a potential enabler for the introduction of higher compression-ratio engines and advanced engine-boost technologies that improve the efficiency and torque

of downsized engines. However, current corn- and soy-based biofuels, and even advanced biofuels, also have significant challenges. The graphic below illustrates the major challenges and benefits of current and advanced biofuels.

## Current Biofuels

### Benefits

- **Increased energy security:** Typically made from domestic and renewable resources, current biofuels could help to improve energy security.
- **Supportive of rural economies:** Biofuels can provide an economic boost to rural communities.
- **Reduced GHG emissions:** Biofuels help to reduce life cycle greenhouse gas (GHG) emissions because the plants from which biofuels are made absorb atmospheric CO<sub>2</sub> while they are growing. Current corn-based ethanol production in the U.S. is estimated to provide a modest (approximately 20 percent) reduction in vehicle GHG emissions on a well-to-wheels basis.<sup>2</sup>
- **Higher octane, more-efficient engine:** Ethanol has higher octane than petroleum gasoline, which can improve engine performance and efficiency, especially if the engine design is optimized for higher-octane fuel. This could be leveraged to offset some or all of the lower energy content relative to gasoline.<sup>3 4</sup>

### Challenges

- **Lack of infrastructure:** In the U.S., E85 refueling infrastructure remains inadequate. Out of more than 160,000 refueling stations in the U.S., approximately 3,300 (or slightly more than 2 percent) offer E85. This trails the availability of E85 vehicles in the marketplace.
- **Lower energy density:** There is approximately one-third less available energy in a gallon of ethanol than in a gallon of gasoline.<sup>1</sup> As a result, drivers using fuels containing higher amounts of ethanol will have to refuel more frequently. Biodiesel has approximately the same energy density as conventional petroleum-based diesel.
- **Competition with the food supply:** In the U.S., ethanol production removes only the starch from the corn kernel – the remaining portion (about one-third of the weight of the corn kernel) is a highly valued feed product (called distillers grains) and a good source of protein and energy for livestock and poultry. This mitigates the competition between ethanol production and food production. When taking into account the livestock feed yield of the distiller's grains, about 30 percent of the U.S. corn harvest is being used for ethanol production.
- **Land-use conversion for biofuel production:** Biofuels can increase overall CO<sub>2</sub> and nitrous oxide emissions through land-use changes, i.e., natural ecosystems being converted to additional farmland for the production of crops to make biofuels. Recent studies indicate that the magnitude of land-use changes in the early studies was overestimated. Significant uncertainty remains, however, and this is an area of active research.

## Advanced Biofuels

### Benefits

### Challenges

- **Reduced GHG emissions:** Next-generation biofuels such as cellulosic bioethanol could offer up to a 90 percent GHG reduction benefit compared to gasoline.<sup>5</sup> These biofuels can be made from “energy crops,” such as switchgrass and wood that require less fertilizer and less energy-intensive farming methods than corn.
- **Reduced competition between food and fuel:** Cellulosic biofuels would allow for the more complete use of crops such as corn and soybeans by using additional parts of these crops, including stems and leaves, for fuel production, potentially reducing competition between food and fuel.
- **Technologically feasible:** There has been significant progress in technologies and processes to transform biomass feedstocks into ethanol in recent years, and as of 2014 a few full-scale plants are now in operation in the U.S. and elsewhere, largely overcoming technological barriers to large-scale production of cellulosic ethanol.
- **Regulatory uncertainty:** Regulatory uncertainty associated with recent downward revisions of cellulosic biofuel mandates and the associated poor business case for cellulosic ethanol production in an uncertain market are major challenges to further development.
- **Limited capital availability:** Capital to invest in building additional cellulosic biofuel production capacity remains limited due to market uncertainty.
- **Lack of infrastructure:** Advanced biofuels have the same infrastructure challenges as noted above for corn-based ethanol.

Also see:

> [Renewable Fuels Policy](#)

## Deployment

Ford has a long history of developing vehicles that run on renewable biofuels. Our founder, Henry Ford, was a strong proponent of biofuels, and we produced our first flexible-fuel vehicle (FFV) approximately 100 years ago: The Ford Model T was capable of running on gasoline or ethanol.

Since 1997, we have offered FFVs capable of running on gasoline or E85 ethanol (or E100 hydrous ethanol, as preferred in Brazil). In the U.S., we met our commitment to double our FFV production from 2006 to 2010. To date, we have introduced more than 6.4 million FFVs globally. Since the 2013 model year, Ford gasoline vehicles sold in the U.S. are capable of running on E15.

In Europe, all of our new diesel vehicles can run on B7, a blend containing 7 percent biodiesel. We have worked with fuel standards organizations to allow the use of biodiesel blends greater than B7 in our future products. In order for biodiesel to be a success, it is critical that the fuel be blended to meet stringent standards for quality and consistency. In the U.S. since 2012, our F-Series Super Duty<sup>®</sup> trucks with a 6.7L diesel engine, and the new Transit van with a 3.2L turbo diesel, are B20-compatible.

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1. B. Heywood, *Internal Combustion Engine Fundamentals*, McGraw-Hill, New York 1988

2. *Ethanol: The Complete Lifecycle Picture*, Office of Energy Efficiency and Renewable Energy, U.S. Department of Energy, March 2007.

3. H. Jung, M.H. Shelby, T.G. Leone, J.E. Anderson, T. Collings, “Fuel Economy and CO<sub>2</sub> Emissions of Ethanol-Gasoline Blends in a Turbocharged DI Engine,” *SAE International Journal of Engines*, 6(1):422–434 (2013).

4. J.E. Anderson, D.M. DiCicco, J.M. Ginder, U. Kramer, T.G. Leone, H.E. Raney-Pablo, T.J. Wallington, “High Octane Number Ethanol-Gasoline Blends: Quantifying the Potential Benefits in the United States,” *Fuel*, 2012, <http://dx.doi.org/10.1016/j.fuel.2012.03.017>.

5. *Ethanol: The Complete Lifecycle Picture*, Office of Energy Efficiency and Renewable Energy, U.S. Department of Energy, March 2007.

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# CNG/LPG Vehicles

Vehicles that run on compressed natural gas (CNG) and liquefied petroleum gas (LPG – also called propane autogas) typically have lower emissions and lower fuel costs than gasoline and diesel vehicles.



## Technology Overview

Ford offers engine packages specially prepared for conversion to run on CNG and LPG on many of our vehicles targeted to the commercial fleet market. Our gaseous-fuel-prepped engines include hardened components such as valves and valve seats that can withstand the higher operating temperatures and lower lubricity of gaseous fuels.

Our vehicles with gaseous-prepped engines can be converted to either dedicated alternative fuel systems, which can only run on either CNG or LPG, or to bi-fuel systems, which can run on the alternative fuel or on regular gasoline. Bi-fuel vehicles generally have longer range than a dedicated gaseous fuel vehicle because they have the combined range of both on-board fuel types.



**Ford F-150 Pickup**

CNG and LPG vehicles have both environmental and economic advantages. Vehicles using these fuels have lower carbon dioxide (CO<sub>2</sub>) emissions and lower total greenhouse gas (GHG) emissions than gasoline or diesel vehicles.

## Benefits

CNG and LPG vehicles have both environmental and economic advantages. Vehicles using these fuels have lower carbon dioxide (CO<sub>2</sub>) emissions and lower total greenhouse gas (GHG) emissions than gasoline or diesel vehicles. When running on CNG, vehicles typically emit about 25 percent less CO<sub>2</sub> and about 10 percent fewer total GHG emissions on a well-to-wheels basis, according to Argonne National Laboratory's GREET model. LPG-fueled F-series trucks typically emit 17 to 24 percent fewer total life cycle GHG emissions, according to a study commissioned by the Propane Education and Research Council. CNG and LPG also reduce non-CO<sub>2</sub> tailpipe emissions such as nitrogen oxides (NOx), sulfur oxides (SOx), particulate matter and carbon monoxide.

CNG and LPG have significantly lower fuel costs in the U.S. in comparison to gasoline and diesel, often resulting in reduced conversion cost "payback" for certain business fleets.

## Deployment

Interest in CNG and LPG vehicles is growing globally. In the U.S., for example, sales of Ford's commercial vehicles with CNG/LPG prepped engine packages increased by more than 350 percent from 2009 to early 2013. We work with qualified vehicle modifiers (QVM) to convert vehicles with gaseous prepped engines to CNG (Altech-Eco, IMPCO, Landi Renzo, Venchurs and Westport) and LPG (ROUSH CleanTech).

Ford's approach to CNG and LPG vehicle conversions using QVMs offers a range of

benefits. For example, the competition among QVMs has resulted in improved quality and reduced prices for conversion systems, as well as spurring innovation and technology improvements. This approach has made it possible for Ford to offer a much wider range of commercial vehicles with CNG and LPG than other full-line manufacturers.

In the U.S., Ford offers CNG and LPG gaseous fuel prepped engine packages for a range of our most popular commercial vehicles, including the Ford F-150, multiple variants of the Transit Connect, E-Series, F-series Super Duty® and medium-duty trucks, and the Lincoln MKT.

In Australia, Ford offers LPG versions of the Ford Falcon Ute commercial vehicle using Ford's EcoLPi engine technology. In Europe, we offer LPG conversions of various models in markets where dedicated infrastructure exists, such as Spain, Portugal, Italy, Germany and Turkey. In Germany, for example, we offer CNG bi-fuel versions of the Ford C-MAX and Focus.

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# Hydrogen Fuel Cell Vehicles (FCVs)

Hydrogen fuel cell vehicles are electric vehicles powered by hydrogen fuel cells. They emit only water vapor and heat, with no other tailpipe pollutants.



## Technology Overview and Benefits

FCVs are similar to battery electric vehicles (BEVs) in that they use a high-voltage electric motor to propel the vehicle. Unlike BEVs, however, FCVs are equipped with a hydrogen fuel tank and a fuel cell system that generates electric power to drive the electric motor. FCVs use onboard hydrogen stored in the fuel tank and are refueled in minutes, while BEVs are powered by electric energy stored in the high-voltage battery. As a result, FCVs provide the environmental benefits of a BEV but they have a longer driving range and significantly shorter refueling time.



**Ford Focus**

*We believe that hydrogen-powered fuel cell vehicles may be an important long-term solution for diversifying our energy sources, as well as for reducing greenhouse gas (GHG) emissions, if hydrogen fuel emerges as an economically viable energy carrier.*

In a FCV, an automotive fuel cell propulsion system runs the vehicle by converting hydrogen and oxygen into electrical current through an electro-chemical reaction in the fuel cell stack. It emits just water vapor and heat, without other tailpipe pollutants. Therefore, FCVs are considered to be zero-emission vehicles. FCVs can also be hybridized with a high-voltage battery, to improve vehicle performance and better optimize the cost and robustness of the fuel cell propulsion system. In fact, all of our efforts to improve high-voltage electronics, electric motors, regenerative braking and battery technology on BEVs, HEVs and PHEVs can be applicable to FCVs, if and when these vehicles become commercially viable.

We believe that hydrogen-powered fuel cell vehicles may be an important long-term solution for diversifying our energy sources, as well as for reducing greenhouse gas (GHG) emissions, if hydrogen fuel emerges as an economically viable energy carrier. Therefore, Ford has committed to significant hydrogen fuel cell research and development.

## Deployment

### Technology Demonstration

Ford has been working on fuel cell vehicle development and technology demonstration for more than a decade. From 2005 to 2009, we participated in a technology demonstration program partially funded by the U.S. Department of Energy (DOE), as well as in other government-supported demonstration programs in Canada and Europe. Through the DOE program, a fleet of 30 Ford Focus FCVs was tested to demonstrate technical feasibility, performance durability and reliability in real-world conditions. These vehicles

accumulated more than 1 million driving miles without significant technical problems. Based on the knowledge gained in this first generation of fuel cell technology, we have completed development and laboratory validation of additional generations of fuel cell technologies. The later-generation technologies improve the robustness and “freeze start” capability of the fuel cell propulsion system.

## Challenges of Commercialization

Even with the advances we have made in hydrogen technology over the past 10 years, we still have challenges to overcome before hydrogen FCVs can compete in the market with current vehicle technology. The cost and durability of the fuel cell system are the most significant challenges. For example, extensive DOE analysis has not yet revealed an automotive fuel cell technology that meets the DOE’s targets for real-world commercialization, or that maintains proper performance throughout the targeted lifetime while staying within the targeted cost. And, significant challenges remain related to the cost and availability of hydrogen fuel and onboard hydrogen storage technology. To overcome these challenges and make fuel cell vehicle technology commercially viable, we believe further scientific breakthroughs and continued engineering refinements are required.

Producing and distributing hydrogen fuel is another important hurdle on the road to implementing hydrogen-powered FCVs. The GHG-reduction benefits of hydrogen fuel depend on which procedures and feedstocks are used to produce the hydrogen. Currently, the state-of-the-art procedure is a distributed natural gas steam-reforming process. However, when FCVs are run on hydrogen reformed from natural gas using this process, they do not provide significant environmental benefits on a well-to-wheels basis (due to GHG emissions from the natural gas reformation process). It would be necessary to employ carbon-sequestration technologies in hydrogen production from fossil fuels or increase the use of renewable energy sources to enable the hydrogen for hydrogen-fueled FCVs to provide significant environmental benefits.

Even if the challenges of producing hydrogen can be overcome, there is still no widespread hydrogen fueling system. Therefore, new infrastructure requires investment, design and execution throughout the country to make hydrogen-powered vehicles commercially attractive to Ford customers.

## Continuing Research and Development

Given these significant challenges to commercialization, Ford has reprioritized its internal resources to concentrate on core fuel cell research that will help increase the commercialization potential of FCVs, including materials development and basic scientific research to solve cost and durability challenges. Working alone, Ford will not be able to overcome all of the challenges hydrogen vehicles face. That is why Ford is collaborating with a wide range of partners. For example, Daimler, Ford and Nissan continue to collaborate on the research and development of hydrogen FCV technology.

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# Vehicle Fuel Efficiency and CO<sub>2</sub> Emissions Progress and Performance

The carbon dioxide (CO<sub>2</sub>) that vehicles emit during their use (rather than emissions produced during their manufacturing or disposal) depends on three primary factors: the vehicle’s fuel efficiency, the greenhouse gas (GHG) profile of the fuel used to power the vehicle, and driver behavior. We are working on all three areas to reduce emissions from our vehicles.

Our shorthand for these three factors influencing use-phase vehicle emissions is:

**GHG Emissions =**

		
<b>Vehicle</b>	<b>+ Fuel</b>	<b>+ Driver</b>

*A vehicle’s fuel economy and use-phase CO<sub>2</sub> emissions depend on many characteristics of the vehicle itself, such as its weight, powertrain and aerodynamics. We are making significant progress in improving fuel economy and vehicle CO<sub>2</sub> emissions.*

*Use-phase vehicle emissions also depend on fuel type and quality and the “well-to-wheels” GHG profile of the fuels used in the vehicles. Emissions can be reduced with lower-carbon fuels, electrification, biofuels and gaseous fuels including compressed natural gas (CNG) and liquefied petroleum gas (LPG, or propane autogas).*

*Consumers influence use-phase emissions through their choice of vehicle, how they drive and how they maintain the vehicle. We are working to help drivers improve the fuel efficiency of their driving behavior and to help fleets choose the most cost-effective, fuel-efficient vehicles for their drivers.*

Life cycle analyses have found that 80 to 90 percent of vehicle-related GHGs are emitted during the use phase.

**READ MORE:**

*Relative GHG contribution of different life cycle and value chain stages of our products*

> [Ford’s Greenhouse Gas Footprint](#)

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# Vehicle



## A Portfolio Approach

As we work to meet our climate change goals, we recognize that there is no single “technology winner” for improving fuel efficiency and cutting vehicle carbon dioxide (CO<sub>2</sub>) emissions. That is why Ford is taking a “portfolio approach” to developing sustainable technologies and alternative fuel options.

We are focused on implementing the most cost-effective fuel-efficiency technologies that can be used not for hundreds or thousands of our vehicles, but for millions, because that is how Ford can truly make a difference. We believe that traditional gasoline- and diesel-powered vehicles with internal combustion engines will continue to be a major part of the vehicle mix for quite some time. So we are working to improve the fuel efficiency of the engines and transmissions of our current vehicles, along with every vehicle subsystem.

To do this, we are developing or have introduced a wide variety of new engine and transmission technologies – including EcoBoost® engines and advanced six-, nine- and 10-speed transmissions – as well as electrical system improvements, weight reductions and aerodynamic improvements that deliver significant fuel-economy benefits in the near term. For example, as of March 2015 we had produced 5 million EcoBoost-equipped vehicles globally. We now offer EcoBoost engines on 100 percent of our North American and European nameplates and 80 percent of our nameplates globally.

We have also introduced advanced powertrains and alternative-fuel vehicle options. These include:

- advanced diesel engines,
- electrified products, such as hybrid electric vehicles (HEVs), plug-in hybrid electric vehicles (PHEVs) and all-electric vehicles, and
- alternative-fuel vehicles, including natural gas- and propane-ready engines and vehicles that can operate on higher blends of biofuels.

For example, we offer six electrified vehicles (EVs) in the U.S: the all-electric Ford Focus Electric, the Ford Fusion Energi and Ford C-MAX Energi PHEVs, and three HEVs. In Europe, we offer three electrified vehicles: the Focus Electric, the C-MAX Energi PHEV and a hybrid electric version of the Ford Mondeo. We plan to launch additional electrified vehicles in other global markets in coming years. We are electrifying global vehicle lines rather than limiting development to a single, special electrified vehicle model to give our

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customers a choice of vehicles to best meet their needs.

Our goal is to provide diversity in fueling options, in order to meet customers' differing needs while improving vehicle energy efficiency and long-term sustainability. We call this approach the "power of choice," because it allows customers to choose the vehicle that best suits their needs from a wide range of advanced technologies implemented across our product lineup.

To deliver this power of choice strategy we are developing global vehicle platforms that are compatible with a wide range of fuels and powertrain technologies. This allows us to offer a portfolio of options to our customers, target options to regions where they make the most sense, and evolve our vehicles as technologies and markets develop. Global vehicle platforms that have "plug-and-play" compatibility with a wide range of technologies will also allow us to make the range of fuel and powertrain options available more affordably. For example, the all-electric Ford Focus, the Ford C-MAX hybrid and the C-MAX Energi plug-in hybrid are all built on our global C-car platform.

Furthermore, we have committed that for each of our new or significantly refreshed vehicles, we will offer a powertrain with leading fuel economy.

Also see:

> [Sustainable Technologies and Alternative Fuels Plan](#)

The following are some examples of our fuel-efficient vehicles and progress in improving fuel efficiency by region.

## North America

We are improving the fuel economy and CO<sub>2</sub> emissions of our vehicles by introducing vehicles with the technologies identified in our [Sustainable Technologies and Alternative Fuels Plan](#) and vehicles that offer outstanding fuel economy and reduced CO<sub>2</sub> emissions.

For example, we further expanded the use of our EcoBoost® engines, which significantly improve the fuel economy of gasoline engines. At the end of 2014, 100 percent of our North American nameplates offered EcoBoost engines.

We continue to offer six electrified vehicles (EVs) in the U.S.: the all-electric Ford Focus Electric (a battery electric vehicle, or BEV), the Ford Fusion Energi and Ford C-MAX Energi plug-in hybrid electric vehicles (PHEVs), and three hybrid electric vehicles (HEVs).

Electrified vehicles still only represent a small fraction of U.S. vehicle sales. EV sales are being negatively impacted by the significant decrease in fuel prices that began in mid-2014; fuel prices are forecasted to remain low throughout 2015. In the U.S., overall industry sales of EVs were at 563,777 vehicles in 2014, up 1 percent from 2013 sales. However, the sales of EVs as a percent of total vehicle sales was down slightly: EV sales were 3.6 percent of overall industry vehicle sales in 2014, down from 3.8 percent in 2013.<sup>1</sup>

In 2014, Ford sold 86,587 EVs, including BEVs, HEVs and PHEVs – down 1 percent compared to 2013. However, Ford sold an all-time record number of PHEVs in 2014 (the Fusion Energi and C-MAX Energi), with full-year total sales of 19,983 PHEVs, up 53 percent over 2013. Ford EV sales accounted for 3.6 percent of overall company sales, up from a 3.5 percent share in 2013. Ford's share of the overall retail EV market was 13.3 percent in 2014, down

### Fuel Economy Progress in Our U.S. Vehicles

In 2014, the average fuel economy of our U.S. car fleet and U.S. truck fleet both remained unchanged compared to 2013. However, our combined corporate average fuel economy improved by about 2 percent due to increased customer demand for cars versus trucks. Our combined fleet CO<sub>2</sub> emissions improved by 9 percent compared to 2009. We are making progress on our climate stabilization goals for vehicle CO<sub>2</sub> emissions in North America.

from the 13.9 percent in 2013, but we still maintained the second-highest market share in the EV industry behind Toyota.

And, we know that Ford EVs are already helping to reduce CO<sub>2</sub> emissions. As of late April 2015, Ford plug-in electric vehicles (the Focus Electric BEV and Fusion Energi and C-MAX Energi PHEVs) had been driven for approximately 361 million electricity-powered miles. These “all-electric” miles have resulted in a reduction of approximately 27 million kg of CO<sub>2</sub> compared to gasoline-powered driving. Ford PHEV and BEV owners drive an additional 800,000 all-electric miles nearly every day.

In 2014, we lowered the fuel economy ratings of six vehicle nameplates sold primarily in the U.S. and Canada in the 2013 and 2014 model years. Ford identified an error in the original fuel economy ratings for these vehicles through internal testing and reported the matter to the U.S. Environmental Protection Agency (EPA). We then worked with the EPA to retest the vehicles and determine the correct fuel economy ratings. We also made goodwill payments to customers who purchased or leased the affected vehicles, based on the difference between the original and the revised combined fuel economy ratings.

## Europe

Ford offers one of the broadest low-CO<sub>2</sub> vehicle portfolios in Europe. We are using a variety of technologies to accomplish this. We offer six ECONetic vehicles, which are ultra-low-CO<sub>2</sub> versions of selected Ford diesel vehicles that leverage several advanced, fuel-saving technologies.

In addition, we offer six EcoBoost<sup>®</sup> gasoline engines in Europe – the 2.3L, 2.0L, 1.6L and 1.5L and the multi-award-winning 1.0L EcoBoost engines – which are available on 15 models of Ford vehicles. In 2014, one out of five Ford vehicles sold in Europe was equipped with the 1.0L EcoBoost engine. These engines are available in combination with other fuel-saving technologies such as [Auto Start-Stop](#), Smart Regenerative Charging, [Active Grille Shutter](#) and [EcoMode](#).

In 2014 we continued to extend our global electric vehicle plan to Europe. We now offer the Ford Focus Electric (an all-electric vehicle), the Ford C-MAX Energi plug-in hybrid, and a hybrid version of the Ford Mondeo, the first hybrid electric car built and sold by Ford in Europe. We also offer liquefied petroleum gas (LPG, or propane autogas) versions of the Ford Fiesta, Focus, B-MAX and C-MAX. All of our diesel vehicles can run on up a fuel blend of up to 7 percent biodiesel (B7).

In total, Ford offers 92 models and variants in Europe with CO<sub>2</sub> emissions below 130 g/km, of which 21 models or variants have CO<sub>2</sub> emissions below 100 g/km.

## Asia Pacific

We now offer three electrified vehicles in the Asia Pacific region: the Lincoln MKZ Hybrid and Ford Fusion Hybrid in South Korea, the Ford C-MAX Hybrid in Guam, and we will be offering the Ford Mondeo Hybrid in Taiwan from mid-2015.

In the Asia Pacific region, we are launching more vehicles equipped with the EcoBoost engine in response to growing consumer demand for more fuel-efficient vehicles. In 2014, EcoBoost was available in 13 vehicles in the region, and by the end

### Continually Reducing Vehicle CO<sub>2</sub> Emissions in Europe

Ford passenger car data show that we have reduced the average CO<sub>2</sub> emissions of our European car fleet by approximately 18 percent between the 2006 and 2014 calendar years. We are making progress on our climate stabilization goals for vehicle CO<sub>2</sub> emissions in Europe.

### Expanding Fuel Efficiency Technologies and Alternative Powertrains in Asia Pacific

We are making progress on our climate stabilization goals for vehicle CO<sub>2</sub> emissions in the Asia Pacific region. We now offer hybrid electric vehicles (HEVs) in several Asia Pacific markets. We also continued to expand the number of vehicles with highly fuel-efficient technologies like the EcoBoost<sup>®</sup> engine. As of the end of 2014, we offer EcoBoost engines on 13

of 2015, we will offer EcoBoost engines in more than 20 vehicles, a five-fold increase from 2012. The 1L I-3 EcoBoost is offered in the region on the Ford Fiesta (available in Australia, China, Japan, New Zealand, Taiwan, ASEAN and APEM) and on the Ford EcoSport (available in Australia, China, India and New Zealand). The 1.5L I-4 EcoBoost is available in the new Ford Mondeo in China. We also offer the 1.6L and 2.0L I-4 EcoBoost variants in the Ford Edge, Kuga/Escape, Mondeo/Fusion, Falcon, Focus ST, Fiesta ST, Taurus and Explorer and in the Lincoln MKZ and MKC; and the 2.3L EcoBoost in the all-new Ford Mustang. In March 2014, Ford's joint venture Changan Ford Automobile Co., Ltd. (CAF) began producing 1L EcoBoost engines at a new engine plant in Chongqing to power the Ford Fiesta and EcoSport vehicles built for China.

vehicles in the region. By the end of 2015, we will offer over 20 vehicle models with EcoBoost engines.

The fuel-efficient EcoBoost engines are being well received by our customers in the Asia Pacific region. In 2014, sales of EcoBoost-equipped vehicles in Asia Pacific increased 63 percent from a year earlier, up 59 percent in China alone.

In China, Ford will upgrade its entire powertrain portfolio with 20 advanced engines and transmissions to support its aggressive plan to introduce 15 new vehicles to China by the end of 2015. These advanced, fuel-efficient technologies – including turbocharging, direct injection, twin independent variable camshaft timing (Ti-VCT) and six-speed transmissions – will deliver more than a 20 percent improvement in fuel economy to Ford's passenger vehicle fleet in China, which represents a key part of Ford's near-term sustainability goals in China.

In India, we are also continuing to introduce vehicles with excellent fuel economy. We offer a 1.0L EcoBoost on the Ford EcoSport, the first vehicle in India to have this technology. We also continue to offer the Ford Fiesta – powered by TDCi diesel powertrain – that delivers outstanding fuel economy and reduced CO<sub>2</sub> emissions. This strengthens Ford's efforts to deliver great fuel economy established with the Ford Figo, launched in March 2010, which is offered with two engine options: a fuel-efficient 1.4L TDCi diesel and a very competitive 1.2L gasoline engine.

In Australia, we offer the 1.0L EcoBoost on the Fiesta and all-new EcoSport. We also offer EcoBoost versions of the Ford Mondeo, Falcon, Fiesta ST, Focus ST and Kuga. Also in Australia, we offer our EcoLPi liquid-injection liquefied petroleum gas (LPG) system for the Falcon, providing customers with the most advanced LPG technology on the market. The Falcon EcoLPi fuel system improves fuel economy by 12 to 15 percent, while also improving power by approximately 27 percent over the prior LPG Falcon model.

## South America

We offer one electrified vehicle in South America: the Ford Fusion Hybrid, which is available in Brazil where it is the most fuel-efficient light vehicle on the market. We now offer our EcoBoost® engine on the Ford Mondeo and Kuga in Argentina and the Ford Fusion in Brazil.

Also in South America we are continuing to implement the new, more-efficient "Sigma" engine, which improves efficiency compared to current engines through reduced internal friction and improved electronic throttle controls. We have also improved the gearing ratios, aerodynamics and rolling resistance of our South American models, further increasing fuel economy.

### Improving the Fuel Efficiency of Our South American Vehicles

We are on track to meet our climate stabilization goals for vehicle CO<sub>2</sub> emissions in South America. We are improving the fuel economy of our vehicles in the region by introducing some of the efficient engine and transmission technologies currently used in North America, and by offering technologies compatible with the widespread use of biofuels in Brazil. In Brazil, our largest market in the region, the Ford EcoSport is a fuel economy leader in its segment. The New Ford Ka received an "A" rating in the compact category for fuel efficiency in the [new Brazilian fuel-efficiency](#)

[Labeling system](#). The Ford Fusion Hybrid is the most fuel-efficient light vehicle available in Brazil.

Over the past few years, we have successfully implemented a large number of fuel-efficiency technologies in our B- and C-sized vehicle segments, which make up approximately 80 percent of the Brazilian market. These include twin independent variable cam timing engines and direct-injection engines, Battery Management Systems, smart alternator systems and dual-clutch automatic transmissions.

## Beyond CO<sub>2</sub>

While CO<sub>2</sub> is by far the most important greenhouse gas associated with the use of motor vehicles, small amounts of other greenhouse gases are also emitted during the vehicle use phase, notably methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O) and hydrofluorocarbon-134a (HFC-134a). We take a holistic view of climate change and are addressing non-CO<sub>2</sub> emissions in our research, product development and operations.

Through our Restricted Substance Management Standard we have prohibited non-CO<sub>2</sub> greenhouse gases such as perfluorocarbons (PFCs) and sulfur hexafluoride (SF<sub>6</sub>).

Also see:

> [Sustainable Materials Management](#)

Ford has been a leader in conducting research on chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs) and hydrofluoroolefins (HFOs), which are used as refrigerants in vehicle air conditioning (AC) units, have warming effects on the atmosphere and contribute to climate change. CFCs, which are commonly known for their negative impact on the Earth's ozone layer, also have the highest global warming potential of these three refrigerants. Since the 1990s, we have replaced all CFC refrigerants with HFCs, which do not contribute to stratospheric ozone depletion and have significantly lower global warming impacts. The global warming potential of HFC-134a is 1,370,<sup>2</sup> compared to CFC-12's global warming potential of 10,900.

Switching from CFC to HFC refrigerants led to a dramatic (approximately 30-fold) decrease in the climate impact of refrigerant emissions per vehicle for an AC-equipped vehicle. We estimate that life cycle emissions of HFC-134a from vehicles manufactured in 2010 are approximately 100 g per vehicle per year.<sup>3</sup> We believe that HFC-134a emissions from a typical light-duty vehicle manufactured in 2017 will be approximately 50 g per vehicle per year.<sup>4</sup>

We are continuing our scientific research to determine the relative contribution of a wide range of long-lived greenhouse gases on the radiative forcing of climate change, which helps us prioritize our future efforts to reduce non-CO<sub>2</sub> GHG emissions.

### READ MORE:

*Ford takes a holistic approach to the issue of climate change.*

> [Climate Change](#)

*We are implementing a suite of fuel efficiency technologies as well as alternative fuel and powertrain vehicles.*

> [Sustainable Technologies and Alternative Fuels Plan](#)

> [Fuel](#)

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> [Sustainable Materials](#)

1. Industry EV sales and share is estimated due to nondisclosure of data by some competitors.
2. World Meteorological Organization, *Scientific Assessment of Ozone Depletion: 2010*, Geneva (2010).
3. T.J. Wallington, J.L. Sullivan and M.D. Hurley, "Emissions of CO<sub>2</sub>, CO, NO<sub>x</sub>, HC, PM, HFC-134a, N<sub>2</sub>O and CH<sub>4</sub> from the Global Light Duty Vehicle Fleet," *Meteorol. Z.* 17, 109 (2008).
4. S. Pappasavva, D.J. Luecken, R.L. Waterland, K.N. Taddonio and S.O. Andersen, "Estimated 2017 Refrigerant Emissions of 2,3,3,3-tetrafluoropropene (HFC-1234yf) in the United States Resulting from Automobile Air

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# Fuel



Improving fuel economy alone will not reduce life cycle greenhouse gas (GHG) emissions to the levels required for carbon dioxide (CO<sub>2</sub>) stabilization.

We also need fuels with lower fossil carbon content,<sup>1</sup> including biofuels, electricity and gaseous fuels such as compressed natural gas (CNG), liquefied petroleum gas (LPG) and hydrogen. We are developing, considering or have introduced vehicles that can use these lower-carbon alternatives. The graphic below illustrates our deployment of electrified vehicles (EVs), of flexible-fuel vehicles (FFVs) capable of running on higher levels of biofuels, and of vehicles capable of running on CNG and LPG. Our EVs include battery electric vehicles (BEVs), hybrid electric vehicles (HEVs) and plug-in hybrid electric vehicles (PHEVs).

Choose a location:

- > United States
- > Australia
- > Guam
- > South Korea
- > Taiwan
- > Europe
- > Brazil

## United States

Alternative fuels offered:

- BEV:** Ford Focus Electric
- PHEV:** Ford Fusion Energi, Ford C-MAX Energi
- HEV:** Ford C-MAX Hybrid, Ford Fusion Hybrid, Lincoln MKZ Hybrid
- Renewable Biofuels:** Various models of FFVs capable of running on gasoline or E85 ethanol. Ford F-Series Super Duty® trucks with a 6.7L diesel engine and Ford Transit van with a 3.2L turbo diesel can use B-20, a blend containing 20 percent biodiesel.
- CNG/LPG:** CNG and LPG gaseous-fuel-prepped engine packages for a range of our most popular commercial vehicles, including the Ford F-150, multiple variants of the Ford Transit Connect, Transit, F-series Super Duty and medium-duty trucks, and the Lincoln MKT Town Car.

## Australia

Alternative fuels offered:

- LPG:** Ford Falcon Ute commercial vehicle

## Guam

Alternative fuels offered:

 **HEV:** Ford C-MAX Hybrid

## South Korea

Alternative fuels offered:

 **HEV:** Lincoln MKZ Hybrid, Ford Fusion Hybrid

## Taiwan

Alternative fuels offered:

 **HEV:** Ford Mondeo Hybrid

## Europe

(selected markets)<sup>2</sup>

Alternative fuels offered:

 **BEV:** Ford Focus Electric

 **PHEV:** Ford C-MAX Energi

 **HEV:** Ford Mondeo Hybrid

 **Renewable Biofuels:** All of our new diesel vehicles can run on B7, a blend containing 7 percent biodiesel. Ford Focus FFV flex-fuel version that can run on E85 (85 percent ethanol).

 **LPG:** LPG conversions of various models

## Brazil

Alternative fuels offered:

 **HEV:** Ford Fusion Hybrid

 **Renewable Biofuels:** Various models of FFVs capable of running on gasoline or E100 hydrous ethanol

Of course, Ford cannot increase alternative fuel use simply by offering vehicles that can operate with these fuels. Widespread use of these fuels will also require significant efforts by fuel and energy providers, including continued production of the fuels themselves and considerable updating or expansion of refueling infrastructure to make these fuels easily available to drivers at retail outlets. Appropriate government action can also facilitate the adoption of common standards for fuel quality and refueling infrastructure, as well as measures such as tax incentives to encourage manufacturers to produce the fuels, ultimately leading to widespread consumer use of them.

### READ MORE:

We are implementing a suite of fuel efficiency technologies as well as alternative fuel and powertrain vehicles.

> [Sustainable Technologies and Alternative Fuels Plan](#)

We support comprehensive, market-based government policies for addressing climate change.

> [Public Policy](#)

> [Vehicle](#)

> [Driver](#)

1. Of course, there is not only a need to reduce the fossil carbon content of the fuel itself, but to reduce any fossil-based CO<sub>2</sub> emitted during feedstock excavation, fuel production and distribution.

2. All vehicles are not available in all countries in Europe.

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# Driver



The “driver” portion of the greenhouse gas (GHG) emissions equation holds the potential for substantial emission reductions at minimal cost, but it is often overlooked. Ultimately, drivers decide which vehicles and fuels they will purchase and how those vehicles will be driven.

While our major focus is on the vehicles we make, we have also reached out to drivers around the world to promote the practice of “eco-driving.” We do this by providing training, information and vehicle technology that helps drivers learn how to drive using the least fuel possible. We are also facilitating the development of apps and other tools to help drivers track and improve their fuel efficiency. For example, in 2013 we held a Personalized Fuel-Efficiency App Challenge, which resulted in the creation of a range of apps to help customers optimize their personal fuel-economy performance on the road and share that information with others.

## Helping Drivers Improve Fuel Efficiency with Information Technology

Ford’s in-vehicle technology system – SYNC® – offers an array of real-time information on fuel-economy performance that can coach drivers to get more miles to the gallon and save on fuel costs. In addition, our map-based navigation system offers an Eco-Route option that quickly calculates the most fuel-efficient route a driver can take to get from A to B. Ford testing shows that Eco-Route can help achieve fuel economy gains of up to 15 percent.

SmartGauge® with EcoGuide is a dashboard display in the Ford Fusion, C-MAX and Lincoln MKZ Hybrids, the Fusion and C-MAX Energi plug-in hybrids, and the Focus Electric that gives drivers information to help them maximize fuel efficiency.

In Europe, we offer the EcoMode system to help drivers maximize their fuel economy. This system monitors the key parameters for optimal fuel consumption that drivers can affect by changing their driving behavior, including gear shifting, anticipation (i.e., driving as consistently and smoothly as possible) and motorway driving (i.e., driving with the most efficient speed on highways and country roads), and offers information on how to improve fuel economy over time.

## Eco-Driving Information and Training

Ford has demonstrated that drivers who practice “eco-driving” can improve their fuel economy by an average of 24 percent. Eco-driving tips are available to the public on Ford’s website, and online training is available through the Ford Driving Skills for Life (DSFL) program.

In Germany, we offer an eco-driving program through our German dealerships, in partnership with the German Federation of Driving Instructor Association and the German Road Safety Council. By the end of 2014, nearly 18,000 German drivers had been “eco-trained” through this program.

In Asia Pacific, we launched the [Ford DSFL driver training program](#) in 2008. In this region the program places equal emphasis on safe driving and eco-driving, as customers are interested in both. In 2014, the program continued in mainland China, India, Taiwan, Thailand, Indonesia, Vietnam and the Philippines, as well as expanded to Malaysia and Myanmar, training another 10,000 people. Approximately 90,000 people have been trained in the Asia Pacific region since the program began. We are expanding Ford DSFL to Australia in 2015.

## Helping Fleet Customers Make More Fuel-Efficient Choices

We developed the Fleet Purchase Planner™ to help our fleet customers assess the relative cost and emissions benefits of different vehicle options based on the specific use factors of their fleet and choose the best vehicles from Ford’s lineup to manage their costs and reduce their company’s carbon footprint.

The Fleet Purchase Planner™ includes several tools. First, it offers an Emissions and Fuel Cost Calculator, which compares the carbon dioxide (CO<sub>2</sub>) emissions and fuel costs of two vehicles or vehicle technologies based on their fuel economy and customer-specific factors such as annual miles driven, city versus highway driving conditions and local fuel prices. The results help our customers understand the relative benefits of different technologies, such as an EcoBoost® engine compared with a hybrid vehicle; different fuels, like gasoline versus compressed natural gas or diesel; and, for plug-in vehicles, different electricity carbon footprints in different regions of the country. For example, for customers deciding where to place battery electric vehicles in their fleets, the Calculator shows that the Focus Electric emits about 70 g CO<sub>2</sub> equivalent/km using electricity from the low-carbon California grid but more than twice as much, about 150 g CO<sub>2</sub> equivalent/km, in the more coal-intensive Southeast U.S.

But most fleets deal with hundreds or thousands of vehicles. Comparing all the available vehicle and technology replacement options for cost and sustainability across a fleet of many vehicles is a complex task. So, we developed additional tools to help fleets meet this challenge. The Fleet CO<sub>2</sub> Footprint Status Calculator helps fleets calculate the carbon footprint of their current fleet. Customers provide a list of the Vehicle Identification Numbers (VINs) for all the vehicles in their fleet, and can customize this carbon footprint by adding in specific details on the locations of their vehicles, alternative fuels used, annual mileage, driving patterns and other criteria. This tool also calculates the annual fuel cost for the whole fleet. The CO<sub>2</sub> footprint and fuel cost become the baselines for evaluating the benefit of new vehicle purchases.

Finally, the Purchase Recommender helps fleet customers determine the right combination of replacement vehicles to meet their cost and environmental goals. Customers choose the type of cost they want to minimize: purchase price, purchase price plus fuel cost, or total cost of ownership. Then the Purchase Recommender calculates the exact combination of new vehicles they should buy to meet the same transportation needs as the vehicles they are replacing while minimizing their costs and CO<sub>2</sub> footprint. It also shows customers combinations of vehicles they could buy to make even greater reductions to the overall

CO<sub>2</sub> footprint of their fleet, including the associated purchase price and fuel costs.

**READ MORE:**

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*We are making progress on our vehicle CO<sub>2</sub> reduction goals across all our regions.*

> [Vehicle](#)

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*We are implementing alternative fuel and powertrain vehicles to help reduce the CO<sub>2</sub> emissions of our products.*

> [Fuel](#)

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*We have developed and support an array of programs and technologies that help to encourage safer behavior on the roadways.*

> [Encouraging Safer Driving](#)

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# Non-CO<sub>2</sub> Tailpipe Emissions

Smog-forming vehicle 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 (NO<sub>x</sub>), carbon monoxide and particulate matter.

Impacts on air quality and the related health risks from vehicle tailpipe emissions are something we take very seriously. We recognize that these pollutants increase with increasing vehicle congestion, and are, therefore, very significant in “megacities” and other highly congested areas. With increasing numbers of vehicles on the road, we are working hard to address air quality with more fuel-efficient and alternative powertrains.

*We are addressing air quality with more fuel-efficient and alternative powertrains.*

On a global basis, however, we believe that reductions in these non-carbon-dioxide (CO<sub>2</sub>) tailpipe emissions are an important sustainability success story. Overall, non-CO<sub>2</sub> tailpipe emissions from vehicles are decreasing rapidly. In the U.S., for example, these emissions have been reduced by more than 99 percent per vehicle-mile in gasoline light-duty vehicles since 1970.<sup>1</sup> Even in emerging economies such as China, the data available through 2009 show that non-CO<sub>2</sub> emissions from the total vehicle fleet on the road are decreasing even as the total number of vehicles on the road is increasing.<sup>2</sup> Nonetheless, we are committed to developing and implementing technologies that will reduce non-CO<sub>2</sub> tailpipe emissions even further.

*Overall, non-CO<sub>2</sub> tailpipe emissions from vehicles are decreasing rapidly.*

## U.S.

Since 2010, the U.S. Environmental Protection Agency (EPA) has required that vehicles be certified to the EPA’s Tier 2 regulations, a comprehensive and challenging set of vehicle emissions requirements. The Tier 2 program has been highly successful at reducing smog-forming emissions from vehicles and improving urban air quality. The EPA estimates that, as of 2010, this program had cut oxides of nitrogen emissions (from all relevant mobile sources) by at least 1.2 million tons. Our own studies suggest that the emission-reduction benefits of modern vehicles that meet Tier 2 standards will continue to increase as older vehicles that were produced before the Tier 2 standards came into effect are replaced by modern vehicles.<sup>3</sup> California also has a stringent Low Emission Vehicle II (LEV II) program for light-duty vehicles; the LEV II requirements differ somewhat from the federal Tier 2 program.

In 2014, the EPA adopted new Tier 3 standards, which are more

stringent standards that will be phased in beginning with the 2017 model year. According to the EPA, the Tier 3 standards for non-methane organic gas (NMOG) and NOx emissions for light-duty vehicles represent an approximately 80 percent reduction from today's fleet average for those emissions, as well as a 70 percent reduction in per-vehicle particulate matter (PM) emissions compared to today's fleet average. The Tier 3 standards for heavy-duty vehicles represent about a 60 percent reduction in fleet average NMOG, NOx and per-vehicle PM emissions compared to today's fleet average. The EPA is also extending the regulatory useful life period during which the standards apply, increasing it from 120,000 miles to 150,000 miles. Tier 3 is closely aligned with California's LEV III requirements, which began phasing in beginning with the 2015 model year. We plan to comply with both the Tier 3 and LEV III standards as they are phased in.

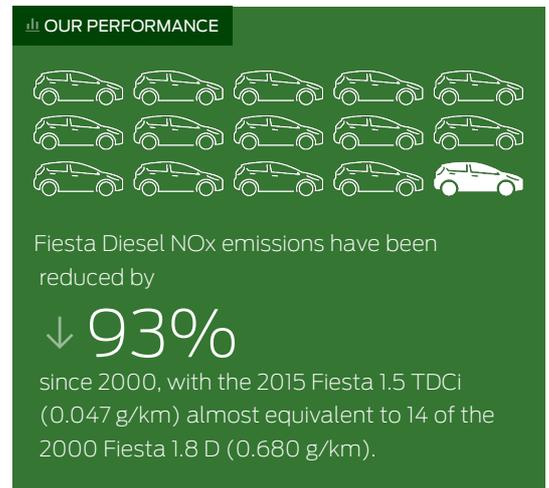
*We plan to comply with both the EPA's Tier 3 standards and California's LEV III requirements as they are phased in.*

## Europe

All of our new passenger cars registered as of January 1, 2014, and all light-duty vehicles registered as of September 2015 comply with the Euro 5 tailpipe emissions standard. Phase I of the Euro 6 standards, which will be even more stringent, will be applied beginning in September 2018 for all new registered cars. Today, the Ford Ka, Fiesta, B-MAX, EcoSport, C-MAX, Focus and Mondeo already comply with Euro 6.

The Euro 5 and 6 standards have generated significant improvements in non-CO<sub>2</sub> tailpipe emissions. Since the Euro 1 emissions regulations were introduced in 1992, particulate matter emissions from light-duty diesel vehicles have decreased by 96 percent. Similar improvements have been achieved for NOx emissions in passenger cars. For example, NOx emissions from the diesel-powered Ford Fiesta have decreased by 93 percent since 2000.

Even with the significant emissions improvements in modern vehicles, however, some smog-forming emissions levels in Europe remain higher than desired. Levels of nitrogen dioxide (NO<sub>2</sub>) measured at the roadside in some locations, for example, exceed the stringent European NO<sub>2</sub> air-quality limits. Ford is working with the European Commission and other stakeholders to define a new emissions test procedure that better measures on-road vehicle emissions for the second stage of Euro 6 regulations. Our own air-quality simulations predict a significant improvement in roadside air quality as the existing vehicle fleet is replaced with newer, cleaner vehicles and as emissions regulations become increasingly stringent.



## Asia Pacific, South America, and Middle East and Africa

In our other regions, Ford is meeting the required tailpipe emissions regulations, which are generally based on the European non-CO<sub>2</sub> emissions regulations system, but vary considerably by country. In China, for example, we are meeting the current regulations, which are based on Euro 4 and Euro 5 standards. In Brazil and Argentina, we are meeting new regulations based on Euro 5. And in the Middle East, we meet the current regulations, based on Euro 2, and will meet future regulations based on Euro 4.

### READ MORE:

[Read more about public policy related to non-CO<sub>2</sub> tailpipe emissions.](#)

[We are implementing a suite of fuel efficiency technologies as well as](#)

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1. T.J. Wallington, J.L. Sullivan, M.D. Hurley, "Emissions of CO<sub>2</sub>, CO, NO<sub>x</sub>, HC, PM, HFC-134a, N<sub>2</sub>O and CH<sub>4</sub> from the Global Light Duty Vehicle Fleet," *Meteorol. Z.*, 17, 109-116, 2008; T.J. Wallington, C.K. Lambert, W.C. Ruona, "Diesel Vehicles and Sustainable Mobility in the U.S.," *Energy Policy*, 54, 47-53, 2013.
  2. Y. Wu, R. Wang, Y. Zhou, B. Lin, L. Fu, K. He, J. Hao, "On-Road Vehicle Emission Control in Beijing: Past, Present and Future," *Environ. Sci. Technol.*, 45, 147-153, 2011.
  3. T.J. Wallington, J.E. Anderson, S.L. Winkler, "Comment on 'Natural and Anthropogenic Ethanol Sources in North America and Potential Atmospheric Impacts of Ethanol Fuel Use,'" *Environ. Sci. Technol.* 47, 2139-2140 (2013).

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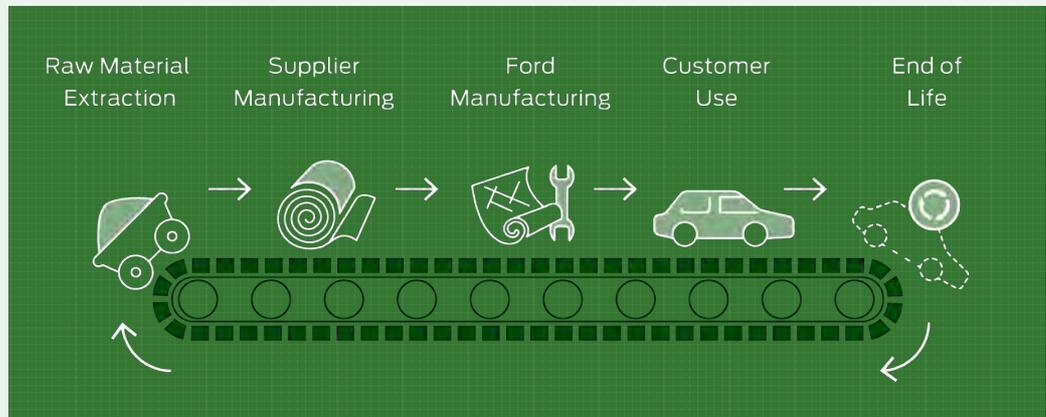
# Sustainable Materials

The choice of materials used to make an automobile is an important driver of its sustainability across all life cycle stages and throughout our value chain. Material selection can influence the safety, fuel economy and performance of the vehicle, as well as the options available to recycle or reuse the vehicle's components at the end of its life.

A material can be more or less sustainable based on a number of factors, including its origin (virgin, renewable or recycled), the natural and human resources and manufacturing methods used to process it, the emissions produced throughout its life cycle, and its application.

## Ford's Sustainable Materials Strategy

We consider the impacts of materials at every stage of a vehicle's life cycle



We are increasing more sustainable materials and eliminating undesirable materials:

### Increase renewable materials

- Improve resource efficiency by replacing petroleum and other nonrenewable resources with plant-based materials

### Increase recycled materials

- Improve resource efficiency by recycling consumer and industrial waste
- Expand closed-loop recycling as much as possible

### Decrease socially unsustainable materials

- Use conflict-free minerals while continuing to support responsible mineral sourcing
- Reduce use of rare earth elements and scarce materials

### Decrease materials with negative environmental or human health impacts

## Increase lightweight materials

- Improve vehicle fuel efficiency by expanding use of lightweight materials
- Substances of concern
- Allergens
- VOC-emitting materials
- Rare earth elements and scarce materials

We define *sustainable materials* as materials obtained by socially sustainable means, with lower environmental impact, and that provide performance equivalent or superior to existing materials. We take a holistic and [life cycle approach](#) to the materials used in our vehicles by:

- [Choosing more sustainable materials](#), increasing our use of more sustainable materials, such as recycled, renewable and lightweight materials that improve environmental and social performance.
- [Reducing undesirable materials](#) that have negative social, environmental or human health impacts. We are working across three main areas:
  - Improving vehicle interior air quality and using allergen-tested materials
  - Eliminating substances of concern
  - Reducing the use of conflict minerals and rare earth or scarce materials
- [Reducing end-of-life impacts](#) by improving the recyclability of our vehicles, including working on closed-loop materials recycling – a process through which we recycle the materials from our auto parts right back into the same use – and participating in vehicle take-back programs where applicable. Our work to eliminate substances of concern also improves vehicle end-of-life impacts.

### READ MORE:



> [What's in a Vehicle](#)

The materials management systems and processes we use to manage these efforts, including our management of rare earth elements.

> [Sustainability Management](#)

Read more on conflict minerals in our Supply Chain section.

> [Conflict Minerals in Our Supply Chain](#)

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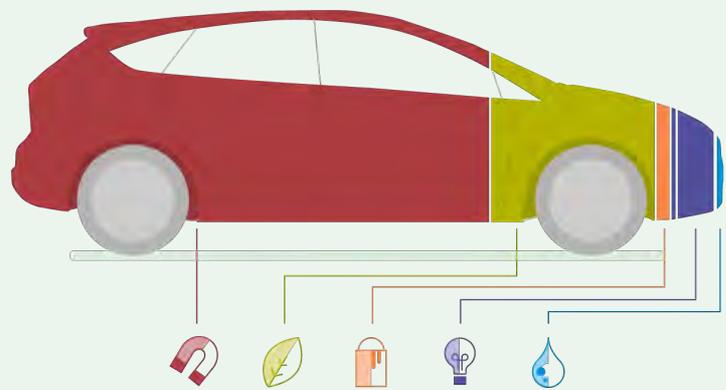
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# What's in a Vehicle

As automobiles have become more sophisticated and capable, they have also become more complex. A typical modern vehicle might contain up to 30,000 different parts made of about 1,000 different types of materials, which in turn are made from about 10,000 different chemical substances.

This typical vehicle compares the relative amounts of primary materials categories used in our vehicles.



Choose a category:

- Metals
- Plastics, Textiles and Natural Materials
- Nondimensional Materials
- Electronics, Ceramics, Glass and Other Compounds
- Fuels and Consumable Liquids

To understand our approach to sustainable materials, it is useful to understand the kinds and amounts of materials that are in our vehicles. This graphic shows the primary materials categories used in our vehicles; read more about those materials, the approximate amounts used in our vehicles, and our sustainable-material strategy.

## Metals



Ford Ranger

Ford Fiesta

Ford Fusion

Ford Edge

79%

76%

76%

76%

Most vehicles are made of at least 75 percent metals by weight. While the metals in today's vehicles are primarily steel and iron, we are working to increase the use of high-strength steel and lightweight metals such as aluminum, magnesium and titanium. By replacing conventional iron and steel with these metals, we can reduce the total weight of the vehicle and therefore help improve vehicle fuel economy. We use life cycle analysis tools to ensure that our decisions to use lighter materials, like aluminum, result in net life cycle energy and carbon dioxide (CO<sub>2</sub>) benefits. Many of these lighter-weight metals can be used and reused in vehicles through closed-

loop recycling processes or simply by purchasing feedstocks with a high percentage of recycled content – a significant environmental benefit over the life cycle of the vehicle. We are using closed-loop recycling of aluminum in the manufacture of the [all-new 2015 F-150](#). All metals are routinely recycled at the end of a vehicle's useful life.

Also see:

> [Lightweight Materials](#)



## Plastics, Textiles and Natural Materials



Ford Ranger

17%



Ford Fiesta

19%



Ford Fusion

18.5%



Ford Edge

18%

These materials are the primary focus of our sustainable materials efforts because they are less commonly recycled at end of life than metals. Though they make up a much smaller percentage by weight of the average vehicle than metals, they are the second-largest category in most vehicles. Increasing the amount of recycled content in these materials diverts waste from landfills. Increasing the amount of renewable content in these materials can reduce our dependence on finite resources and reduce life cycle greenhouse gas emissions. We are using a wide range of recycled-content plastics and renewable, plant-based materials in our vehicles.

Also see:

> [Choosing More Sustainable Materials](#)



## Nondimensional Materials



Ford Ranger

1%



Ford Fiesta

1%



Ford Fusion

1.3%



Ford Edge

1%

These are materials such as paint, adhesives and sealants that have no shape or “dimension” before they are incorporated into a vehicle. Nondimensional materials are often a source of volatile organic compound (VOC) emissions during the vehicle manufacturing process. We are taking steps to replace VOC-emitting materials with alternatives or change our processes to reduce or capture VOC emissions.

Also see:

> [Non-CO<sub>2</sub> Facility Emissions](#)



## Electronics, Ceramics, Glass and Other Compounds



Ford Ranger

0.2%  
electronics

2.3%  
ceramics, glass and  
other compounds



Ford Fiesta

0.5%  
electronics

3%  
ceramics, glass and  
other compounds



Ford Fusion

0.2%  
electronics

3.5%  
ceramics, glass and  
other compounds



Ford Edge

0.2%  
electronics

4%  
ceramics, glass and  
other compounds

Ford has been working with our suppliers, dealers, dismantlers and industry associations (such as the United States Council for Automotive Research (USCAR) Vehicle Recycling Partnership) to develop, share and implement best practices to deal with these categories of materials, which are a small percentage of any given vehicle by weight but historically have been hard to recycle at the end of the vehicle's life. Modern recycling technologies have been developed over the last couple of years that help to maintain an overall vehicle recoverability rate of 95 percent. Dealers and dismantlers are encouraged to reuse or recycle these materials whenever it is technically and economically feasible.



## Fuels and Consumable Liquids



Ford Ranger

0.5%



Ford Fiesta

0.5%



Ford Fusion

0.5%



Ford Edge

0.8%

These materials include the gasoline in the tank, engine oil, lubricants and other liquids. They are generally removed at dismantlers and recycled or reused where possible.

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# Choosing More Sustainable Materials

We are working to improve the sustainability of our vehicles by using materials that are more sustainable from a total life cycle perspective. This includes increasing the use of recycled, renewable, recyclable and lightweight materials.

In this section:

- > [Recycled Materials](#)
- > [Renewable Materials](#)
- > [Lightweight Materials](#)



**Recycled materials** incorporate post-consumer and/or post-industrial waste materials



**Renewable materials** are made from plant-based materials



**Lightweight materials** use special materials and/or designs that provide the same or better performance as other alternatives with less weight.



## Seat fabrics

Seat fabrics in most of our new or redesigned North American vehicles have been made from at least 25 percent post-industrial or post-consumer recycled content.



## Seat foam

Ford currently has soy-foam seats in more than 15 million vehicles on the road, which reduces CO<sub>2</sub> emissions.



## Plastics

We are using natural fiber plastics in a range of vehicle parts including rice-hull reinforced wire harnesses and kenaf-reinforced door interior panels.

## Carpet

Many of the vehicle carpets we use contain between 25 and 100 percent recycled content in the carpet fibers and/or carpet backings.

## Underhood and underbody parts

We use more than 50 million pounds of post-consumer recycled materials on the underhood and underbody parts of Ford vehicles made in North America.

## Body

We cut approximately 700 pounds from the all-new F-150 through extensive use of high-strength steels and aluminum alloys.

### READ MORE:

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*We are increasing our use of recycled content materials and implementing closed loop recycling.*

> [Recycled Materials](#)

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*Ford's renewable materials program has grown from this one application to a large portfolio of plant-based materials.*

> [Renewable Materials](#)

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*We are implementing lightweight materials to improve their fuel economy without compromising safety or performance.*

> [Lightweight Materials](#)

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# Recycled 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 (see [What's in a Vehicle](#) for detail). Therefore, we have concentrated our efforts on developing new uses for recycled materials in the nonmetallic portions of our vehicles, which are typically composed of virgin materials.

Using recycled materials has significant benefits, including:

- Diverting consumer and industrial waste from disposal
- Reducing depletion of natural resources
- Reducing energy consumption
- Reducing costs

Recycled materials do not mean low-quality materials. Our researchers work to ensure that post-industrial and post-consumer recycled plastic materials have the same level of quality and same material specifications as virgin material parts.

## Closed-Loop Recycling and Upcycling

In some cases, we are working to recycle the materials from our auto parts right back into the same use, a process known as “closed-loop recycling.” For example, we are partnering with our aluminum suppliers to recycle post-industrial waste from the aluminum used in the all-new 2015 Ford F-150 into new aluminum that can be used in our vehicles. We are also partnering with our F-150 seat fabric supplier, who has implemented a closed-loop process in which the industrial waste from the production of our seat fabrics is used to create new yarns. They then weave these recycled yarns back into fabrics for the F-150 and other Ford vehicles.

Also see:

[Spotlight: Reinventing the Ford F-150](#)

We are also developing methods for recycling and cleaning post-industrial recycled fascia and bumper scrap so that it can be molded into new fasciae and bumpers. This kind of closed-loop recycling not only reduces our own and our suppliers waste to landfill, it has significant potential to reduce the overall resource impacts of our vehicles.

When possible, we also seek to “upcycle” materials – that is, recycle them into uses with higher material and performance requirements than the virgin material. For example, we are working on upcycling post-consumer laundry detergent containers and milk bottles into blow-molded automotive components. In addition, we are developing a method to

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- ↓ [Using Recycled Materials in Visible Interior Applications](#)
- ↓ [Recycling Parts Removed During Vehicle Servicing](#)

recycle polyurethane foam scrap to make new polyurethane foam components instead of landfilling it at the end of its life. In Europe, we are investigating the use of upcycled post-consumer drinking bottles for energy-absorbing materials.

## Using Recycled Materials in Nonvisible Parts

Our global sustainable materials strategy requires that a wide range of nonvisible plastic parts – such as underbody and aerodynamic shields, fender liners and splash shields – must be made out of plastics from post-consumer recycled waste, such as beverage bottles, tires and automotive battery casings. Most of our recycled-content parts are made of at least half recycled materials. For example, many underbody and underhood plastic parts are made from 75 percent recycled battery casings and 8 percent recycled high-density polyethylene (HDPE) bottles. We also use post-consumer recycled nylon in many underhood parts and recycled textiles in sound-absorption materials.

We use more than 50 million pounds of post-consumer recycled materials on the exterior of Ford vehicles made in North America, which translates to savings of approximately \$10 million per year.

Use of recycled-content parts can also have additional benefits. For example, fabric rear-wheel liners, which contain 30 to 40 percent recycled content, are 50 percent lighter than plastic wheel liners, and they absorb sound, which potentially reduces the need for sound-deadening insulators, sprays and foams.

## Using Recycled Materials in Visible Interior Applications

Across our global operations, we are also using recycled materials for interior parts, where it can be much more challenging to achieve the necessary appearance and performance than using recycled materials for underbody, subsurface and exterior black parts. We are primarily focusing on expanding recycled content in seat fabrics, seat components, carpets and headliner fabrics. All of the recycled-content materials we use meet all of the same stringent appearance and performance requirements of the virgin materials.

Since the 2009 model year, the seat fabrics in most of our new or redesigned North American vehicles have been made from at least 25 percent post-industrial or post-consumer recycled content. Fifty different fabrics meeting these requirements have been developed and incorporated into Ford vehicles. We currently use recycled seat fabrics in 12 out of 17 of the vehicles we offer in North America and Europe. In addition, some of our nonwoven headliner fabrics contain recycled yarns. And, many of the vehicle carpets we use contain between 25 and 100 percent recycled content in the carpet fibers and/or carpet backings. We are also using recycled-content interior materials in other regions. For example, we use REPREVE seat fabric, made from recycled post-consumer plastic bottles, on the Ford Fusion in China.

Ford is the first automaker to use REPREVE® – a hybrid fiber made from recycled plastic water bottles and post-industrial waste – for seating fabric. This fiber, which was introduced on the 2012 Ford Focus, has also been used on the 2013 and 2014 Ford Focus, the 2013 and 2014 Ford Fusion, the 2014 Ford Edge, and the 2015 Ford Mustang and Ford F-150. Approximately 22 plastic, 16-ounce water bottles are used to make the seat fabric in a Focus; approximately 18 20-ounce bottles are used for seats in the Fusion S and SE; and approximately 30 bottles are used for the F-150, depending on the model.



## Recycling Parts Removed During Vehicle Servicing

In Europe, our dealers are contributing to closed-loop recycling of parts that they formerly had to pay to dispose of. In particular, Ford dealers now collect bumpers that were replaced due to damage or other reasons, which are then recycled into new bumpers and other plastic parts.

For more than a decade in the U.S., we have been reusing and recycling parts removed at dealership service centers for reuse in the production of new Ford vehicles. Our Core Recovery Program works similarly to bottle-recycling programs available in many U.S. states. Ford dealership service centers are charged a fee when they order a new part from Ford, but this fee is refunded if the dealer recycles the old part through the Core Recovery Program. When we collect a part from a dealership, we determine whether it is fit for refurbishment and placement into a new Ford vehicle. Parts that can be remanufactured are cleaned, machined and tested to meet Ford quality standards before being used in new Ford vehicles. If a part cannot be remanufactured, we send it to a third party where it is broken down into small pellets that are eventually shipped back to Ford for use in the new-vehicle manufacturing process. During the last 10 years, the program has saved approximately 120 million pounds of vehicle waste from being buried in landfills or sent to junkyards, while also reducing costs.

### READ MORE:



*The new F-150 is Ford's toughest,  
most capable – and most sustainable  
– truck ever.*

[Spotlight: Reinventing the Ford  
F-150](#)

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# Renewable Materials

In 2007, Ford introduced the industry's first use of soy-based foam in seat cushions and backs. In less than a decade, Ford's renewable materials program has grown from this one application to a large portfolio of plant-based materials.

We now have eight different renewable material applications in production, and we are developing many more. We also use renewable materials across our full lineup of vehicles, from our most fuel-efficient and alternative powertrain vehicles, to our F-series trucks, to our luxury Lincoln products. Furthermore, using plant-based materials is a central part of our corporate sustainable materials strategy, and we are focused on continuing to migrate plant-based materials across all of our vehicles.

The average Ford vehicle uses between 20 and 40 pounds of renewable materials, depending on the vehicle size class. Almost 300 parts used across Ford's vehicles are derived from sources such as soybeans, cotton, wood, flax, jute and natural rubber.

All of our plant-based materials meet Ford's strict performance and durability specifications. Renewable materials are key part of Ford's commitment to implement "no-compromise" solutions that help us and our customers reduce environmental impacts without making any compromises on performance and durability.

Using renewable materials in our vehicles can have many environmental, economic and performance benefits. For example:

- Reduced carbon dioxide (CO<sub>2</sub>) emissions
- Reduced vehicle weight, resulting in improved fuel efficiency and lower vehicle emissions
- Reduced use of petroleum
- Creation of new markets for agricultural products and additional revenue streams for farmers
- Reduced manufacturing energy requirements
- Reduced commodity and manufacturing costs
- Using waste stream materials that would otherwise be landfilled or burned

Our current renewable materials include three broad primary technologies: soy foam, plant oil applications and natural-fiber-reinforced plastics.

## Soy Foam

Since 2011, all Ford vehicles built in North America have used soy foam in their seat cushions and backs. In addition, 85 percent of headrests produced in North America have

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soy foam, and the headliner on the Ford Escape is made from soy foam. We continue to investigate new applications for soy foam, such as for underhood and energy-absorbing foams.

### Soy-Foam Seats – A Ford First for Reducing Life Cycle CO<sub>2</sub> Emissions

Ford currently has soy-foam seats in more than 15 million vehicles on the road, which has reduced petroleum usage by more than 15 million pounds. Life cycle analyses that compare soy foams with traditional petroleum-based foams show a net decrease of 5.5 pounds of CO<sub>2</sub> per pound of soy oil used. Ford's use of soy foam in new vehicles reduces our annual CO<sub>2</sub> emissions by more than 20 million pounds – the annual equivalent of emissions from more than 1,500 typical American households. In addition, using soy foam decreases dependence on petroleum and increases the use of renewable agricultural commodities. Soy foam also offers the potential for cost savings as well as insulation from petroleum product price swings.

## Plant Oil Applications

We are developing plant oil applications that use locally available plants, such as soy oil in the U.S., mustard seed oil in Canada, castor oil in tropical regions and palm oil in Asia, Africa and South America. This allows us to use locally available excess plant oils in or near the countries where we manufacture our vehicles.

We introduced plant-based castor oil foam in the instrument panel of the 2012 Ford Focus and 2013 Ford Escape and Mustang. The castor-oil foam, which includes more than 10 percent renewable content, provides a more sustainable interior foam solution than petroleum-based foam. It also reduces scrap due to improved flow and processing characteristics, is more durable than the materials it replaces, and reduces production time by more than 40 percent. Castor-oil-based fuel lines are currently used in most vehicle lines.

We continue to use soybean-oil-based seals and gaskets in eight of our vehicle lines in the U.S. These “green” seals and gaskets also incorporate post-consumer recycled tires, a waste stream that presents significant environmental issues.

## Natural-Fiber-Reinforced Plastics

We use renewable, natural-fiber materials to reinforce plastic and for other applications in vehicles. In 2014, for example, we introduced a new composite plastic material reinforced with rice hulls in the wire harness of the 2014 Ford F-150. The rice hulls, which are a byproduct of rice grains, are sourced from farms in the U.S.

Also in 2014, we launched an industry-first application of cellulose-reinforced plastic in the 2014 Lincoln MKX. This material, developed with Weyerhaeuser and Johnson Controls, is being used to replace fiberglass reinforcement in the center console. The cellulose fibers in this composite come from sustainably grown and harvested trees and related byproducts. The material reduces weight by approximately 6 percent. It also has a smaller carbon footprint than the glass-fiber-reinforced plastic it replaces, in part because it takes less time and energy to mold cellulose-reinforced parts than traditional glass-fiber-reinforced plastics.

Other examples of natural-fiber materials in our vehicles include the following:

- Kenaf, a tropical plant, is used to reinforce compression-molded plastic in door parts. The Ford Escape use a mixture of 50 percent kenaf and 50 percent plastic in the interior door panels. The use of kenaf reduces the weight of the door bolsters by 25 percent, which translates into better fuel efficiency.
- Wheat-straw-reinforced plastic is used in the storage bins of the Ford Flex – the world's first application of this material. The use of wheat-straw-reinforced plastics in

the Flex reduces our petroleum usage by some 20,000 pounds and our CO<sub>2</sub> emissions by about 30,000 pounds annually.

- A material made from 50 percent flax fiber and 50 percent polypropylene is used in the armrest substrate of the Ford B-MAX in Europe.
- Coconut coir, made from coconut husks, is used in the trunk mats of some vehicles, including the Ford Focus Electric BEV.

## Developing Future Renewable Materials

We continue to actively research and develop new renewable materials and applications at Ford's research centers around the world, and through partnerships with automotive suppliers and nonautomotive partners. One of our key research goals is finding ways to use waste products from existing crop and fiber production. We are also working with local communities to ensure that we use locally available and effective plant-based materials. Some of our key research partnerships are outlined below.

### Collaborating to Advance the Use of Bioplastics

In 2014, we were invited to join the [Bioplastic Feedstock Alliance \(BFA\)](#), a new partnership with the World Wildlife Fund, The Coca-Cola Company, Danone, H.J. Heinz Company, Nestle, NIKE, Procter & Gamble and Unilever.

Through this and other research efforts we are working to develop environmentally responsible, socially beneficial and economically viable bioplastic feedstocks and to develop commercially viable applications for plant-based plastics.



Bioplastic  
Feedstock  
Alliance

In addition, we are continuing to work with the Plant PET Technology Collaborative (PTC), a partnership with The Coca-Cola Company, H.J. Heinz Company, NIKE and Procter & Gamble to accelerate the development and use of 100 percent plant-based PET materials. The PTC continues to study chemical pathways to plant-based PET and to support promising research toward that goal. In 2014, the PTC enabled a research program with the University of Delaware's Catalysis Center for Energy Innovation to explore the conversion of renewable biomass, such as trees and grasses, to PET plastic.

### Turning Tomatoes into Car Parts

We are collaborating with the H.J. Heinz Company to explore using tomato fiber, a byproduct of ketchup production, to develop a more sustainable bio-plastic material for our vehicles. Ford researchers are testing the material's durability for potential use in vehicle wiring brackets and storage bins.



[Ford and Heinz Collaborate on Sustainable Materials for Vehicles](#)

### World's First PlantBottle® Fabric



In 2014, we built a PlantBottle demonstration vehicle in which all the interior fabrics for seating, carpets, the headliner and door trim use The [Coca-Cola Company's PlantBottle® technology](#) – a plastic made from 30 percent plant-based materials. Ford researchers worked with Coca-Cola to adapt this technology, formerly only used in plastic packaging, for use in vehicle fabrics. This is the world's first application of the material outside of the packaging industry. If PlantBottle interior fabrics were migrated across the majority of Ford's U.S. models, they would displace nearly 4 million pounds of petroleum-derived materials and save the equivalent of 295,000 gallons of gasoline and 6,000 barrels of oil each year.

### Developing Plant-Based Rubber Applications

As a consortium member of [PENRA \(Program of Excellence in Natural Rubber Alternatives\)](#), Ford Research is collaborating with Ohio State University, the Ohio Agricultural Research & Development Center (OARDC) and industrial members to develop sustainable materials to replace traditional rubber. The focus of PENRA is to research domestic sources of rubber and latex derived from dandelion root and guayule (a plant grown in the Southwest U.S.). Ford also continues its valuable collaboration with the United Soybean Board (USB) to continue research into the use of soybean oil for automotive rubber applications. Soy-based rubber parts – such as radiator deflector shields, air baffles, cup-holder inserts and floor mats – are under consideration for future Ford vehicle programs.

### Leveraging Green Chemistry

In 2015, Ford participated as a Council Member for the [LAUNCH Green Chemistry](#) open innovation platform, hosted by the National Aeronautics and Space Administration (NASA), the U.S. Agency for International Development (USAID), the U.S. Department of State and NIKE. This collaborative effort supports technical innovations to leverage green chemistry for the development of new materials and manufacturing methods.



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# Lightweight Materials

We are actively pursuing the development and use of cutting-edge materials – including high-strength steels, lightweight metals such as aluminum and magnesium, and composite materials – to reduce the weight of our vehicles and improve their fuel economy without compromising safety or performance. For example, in 2014 we introduced the all-new Ford F-150, which makes extensive use of high-strength steels and aluminum.

Also see:

> [Improving Fuel Economy – Weight Reductions](#)

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# Improving Vehicle Interior Environmental Quality

Many people spend a lot of time in their vehicles. Ford is working to provide a healthy environment inside our vehicles by developing a global strategy to address vehicle interior air quality and allergen-containing materials, and to use in-vehicle information technologies to benefit driver and passenger health.

We are developing a set of vehicle interior air quality (VIAQ) specifications that require the consideration of the air quality and allergen impacts of the materials and components in our vehicles. Under this standard, engineers test materials used on components with direct skin contact for allergy issues. The complete VIAQ standards include specifications for fogging, odor, aldehydes, substances of concern, total carbon at the component level, and air filtration. Many vehicles are also equipped with high-performance pollen filters to prevent allergenic pollens from entering the vehicle. Initially, the specifications were applied to European-based vehicles; we are now phasing them in in the U.S. We plan to implement them in our South America, Asia Pacific, and Middle East and Africa operations in the future.

In addition, we're exploring futuristic ways to use in-vehicle communication systems to help drivers monitor and maintain their own health and wellness. We want to change the paradigm that in-car connectivity systems such as SYNC® can only be used for information and entertainment purposes. We recently introduced an Allergy Alert® app for Ford SYNC AppLink™ that allows drivers to check current and upcoming pollen and other health-risk conditions with simple voice commands, while keeping their hands on the wheel and eyes on the road. This app came out of research Ford began in 2012 to assess in-car health- and wellness-connected services that could work with SYNC, such as medical device connectivity, cloud-based health management services and mobile app integration. For example, we are working on systems that can use Ford's hands-free SYNC communication technology to capture biometric and vehicle data as the basis for real-time health and wellness advice and monitoring. Using this technology, a driver could provide voice inputs detailing important aspects of his or her health routine – such as the number of glasses of water consumed during the day, or what pills have been taken. Working with partner companies, the data received from the driver can be uploaded into the driver's approved health data cloud and processed with other health data to create visual reports the driver can access after having left the vehicle.

We are collaborating with Microsoft, Healthrageous and BlueMetal Architects on this research to develop additional systems that extend health management into the personal vehicle in a nonintrusive fashion.

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# Eliminating Undesirable Materials

For more than 30 years, Ford has had a Restricted Substance Management Standard that spells out materials to be avoided or eliminated in Ford operations and in the parts and materials provided by suppliers.

In many cases, we have eliminated substances of concern – or taken steps to reduce them – well ahead of regulatory requirements. For example, Ford is one of the first automotive companies to begin efforts to reduce a range of undesirable chemicals that are monitored by the EU, U.S. and Canadian governments, including hexabromocyclododecane (HBCDD) and decabromodiphenyl ether (decaBDE). 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.

Ford is also leading industry efforts to eliminate undesirable substances by chairing several industrial association working groups on this topic, including the U.S. Council for Automotive Research’s Substances of Concern Committee and the Automotive Industry Action Group’s Chemical Management and Reporting Group. We are also collaborating with global automotive manufacturers and suppliers to develop strategies and plans to eliminate undesirable chemicals across the automotive industry.

We also phased out the use of hexavalent chromium – “hex chrome” for short – globally before global regulations banned the substance. Hex chrome 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 have also eliminated the use of mercury in all vehicle components globally, and we are working to address [end-of-life impacts associated with mercury-containing components](#) in older Ford vehicles.

In North America and Europe, we have completed the transition away from lead wheel weights. Ford’s Customer Service Division no longer offers lead wheel weights for sale to dealers, offering steel wheel weights instead. Ford of Europe has also phased out lead in valve seats in all new vehicle models sold in the EU.

In 2015, the Alliance of Automobile Manufacturers signed a Memorandum of Understanding with the U.S. Environmental Protection Agency committing to phase copper out of brake friction material. Brake friction material has been linked to elevated copper levels in water bodies, because during brake use, brake friction material degrades and can be discharged to water bodies via storm water runoff. Ford already offers vehicles with copper-free brake pads and plans to phase out copper use in its remaining North American products.

### READ MORE:

*Read more about our sustainable materials management processes.*

*Read more about materials-related public policy issues.*

*We design our vehicles up-front to reduce their end-of-life impacts.*

> [Sustainable Materials Management](#)

> [Undesirable Chemicals](#)

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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 (see [What's in a Vehicle](#) for more information). In North America, about 95 percent of vehicles that go out of registration are processed by a dismantler or scrap metal recycling facility, with approximately 86 percent of the vehicle by weight recovered for reuse, remanufacturing or recycling.

In theory, end-of-life vehicles are more than 95 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 19 EU markets and participates in collective ELV recycling systems in another 10. Ford was the first major manufacturer in the U.K. to put in place a comprehensive plan that met the European Commission's ELV Directive. By working with Cartakeback.com, Ltd., we have a network of nearly 230 facilities providing unrivaled 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 2014, this certification was extended for another two years and now comprises all of Ford Motor Company operations globally. All Ford vehicles marketed in Europe are now certified as reaching recyclability of 85 percent and recoverability of 95 percent. An increasing number of vehicle models produced and designed in the U.S. are also following this approach. For example, all U.S. models exported to South Korea are providing self-certification documents meeting the 85 to 95 percent recoverability requirement.

Ford has participated in research into alternative treatments for end-of-life vehicles. Most of the plastic, foam and other nonmetal vehicle materials end up being shredded. Most of this "automotive 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 recycled ASR for energy recovery is as beneficial as recycling it.

We are working to address end-of-life issues associated with mercury in our older vehicles. For example, we helped to forge a collaboration between the U.S. 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 U.S. in 2007 and now has more than 9,900 participants joining the effort from the recycling industry. By the end of 2014, more than 6.5 tons of mercury from these switches had been recovered.

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# Greening Our Operations

We take a rigorous and holistic approach to reducing the environmental impacts of our manufacturing facilities. To drive continuous improvement, we have aggressive global facility environmental targets that address the range of our environmental impacts, including energy use, emissions, water use and waste generation.

Our global, companywide targets include:

- Reducing greenhouse gas emissions from our manufacturing facilities by 30 percent per vehicle produced from 2010 to 2025
- Reducing average energy consumption per vehicle produced by 25 percent globally from 2011 to 2016
- Reducing water use per vehicle produced by 30 percent between 2009 and 2015
- Reducing waste to landfill per vehicle produced by 40 percent between 2011 and 2016

## Progress Toward Our Goals

We made progress toward each of these goals in 2014:

- We reduced carbon dioxide (CO<sub>2</sub>) emissions from our manufacturing facilities per vehicle produced by 2.4 percent compared to 2013.
- We reduced our absolute water use by 3 percent and our water use per vehicle produced by 1.25 percent from 2013 to 2014. We met our 2015 target to reduce water use per vehicle produced two years early and are in the process of updating our global manufacturing water strategy and goals.
- We reduced waste to landfill per vehicle produced by 21 percent compared to 2013.

Manufacturing CO<sub>2</sub> emissions

**2.4%**  
**lower**  
compared to 2013.

Also see:

> [Sustainability Management](#)

### READ MORE:

*We are making progress on our aggressive goals to reduce our facility carbon dioxide (CO<sub>2</sub>) emissions and energy use.*

> [Operational Energy Use and Greenhouse Gas Emissions](#)

*We recognize a basic human right to clean, affordable drinking water and adequate and accessible sanitation.*

> [Water](#)

*Ford has reduced waste to landfill per vehicle produced by more than 50 percent over the last five years.*

> [Waste Management](#)

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# Operational Energy Use and Greenhouse Gas Emissions

Ford is a leader in facilities-related greenhouse gas (GHG) reductions and energy-use reductions, public reporting of our GHG emissions, and participation in GHG-reduction and trading programs.

We have set aggressive goals to reduce our facility carbon dioxide (CO<sub>2</sub>) emissions and energy use. In 2010, we adopted a goal to reduce our facility CO<sub>2</sub> emissions by 30 percent per vehicle produced by 2025.

This CO<sub>2</sub> goal, which is based on our [stabilization commitment](#), complements our long-standing facility energy-use reduction targets. In 2012, we established a five-year objective to improve our operational energy use per vehicle produced by 25 percent globally by the end of 2016, based on a 2011 baseline normalized for weather and production.

## Performance

In 2014, we improved the global energy efficiency of our manufacturing facilities by 21.4 percent against a 2011 baseline normalized for weather and production levels. Our total energy use for all of our facilities increased by 1.6 percent in 2014 compared to 2013. Total energy use per vehicle deteriorated slightly (it increased by 0.2 percent) in that timeframe due to production changes, an increased number of operating facilities and colder weather, which increases the related energy demands. However, we have made significant improvements in energy efficiency over the past few years. From 2011 to 2014, we reduced energy consumption by 2.4 billion kWhs, the equivalent of 90 percent of our total energy consumption in Europe.

Our total CO<sub>2</sub> emissions decreased by 4 percent from 2013 to 2014, and our CO<sub>2</sub> emissions per vehicle produced decreased by 2.4 percent during that period, reflecting increased overall energy efficiency in our facilities. While our CO<sub>2</sub> emissions are linked to the amount of energy we use, they do not necessarily increase or decrease by exactly the same amount as our energy use, due to variations in energy sources and related emissions factors. We reduced our overall facilities-related CO<sub>2</sub> emissions by 11.6 percent, or 0.6 million metric tons, from 2010 to 2014. During this same period, we reduced facilities-related CO<sub>2</sub> emissions per vehicle produced by 22.4 percent.

Also see:

[Climate Change and Environment data](#)

## Reducing Our Energy Use

Ford is achieving energy-efficiency improvements and energy-use reductions using a variety of

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- ↓ [Reducing Energy Use Through Better Information and Management Systems](#)
- ↓ [Other Efforts to Improve Energy Efficiency in Our Plants](#)

In 2013, Ford joined the U.S. Department of Energy's (DOE) Better Buildings, Better Plants program, a

initiatives, many of which are described in this section. We continuously identify innovative technologies, approaches to the identification and definition of potential projects, funding mechanisms and means to implement plant energy-efficiency projects.

national partnership initiative to drive a 25 percent reduction in industrial energy intensity in 10 years against a 2011 baseline. Twenty-two of our U.S. plants are part of this initiative.<sup>1</sup> We have reduced energy intensity<sup>2</sup> by 11.9 percent since 2011 across these 22 plants, considering direct and indirect emission factors.

Since 2000, we have invested more than \$300 million in plant and facility energy-efficiency upgrades. In 2014 alone, we invested more than \$40 million in energy-efficiency projects, and significant energy-related upgrades were included in our global manufacturing system upgrades. We are working across divisions and regions to ensure that energy efficiency is being addressed in our daily operations and incorporated into our manufacturing processes and facilities, as part of our future vehicle program plans.

## Expanding High-Efficiency LED Lighting

In 2014, we continued to focus on lighting, investing \$25 million to upgrade to LED lighting in our manufacturing facilities globally. During the year, we installed more than 25,000 new LED fixtures. These fixtures will reduce energy use by 56 million kWh annually – enough to power more than 6,000 average-sized homes per year – and save approximately \$7 million in energy costs per year. Our [Global Facilities Forum \(GFF\)](#) also rolled out a new global lighting specification, which requires the use of LED technology for all general building lighting requirements. We will continue to update the specification to expand the use of LEDs as the technology advances and is proven effective for our key uses.

Annual energy cost savings of

**\$7 million**

expected from the 25,000 new LED light fixtures we installed globally in 2014.

## “3-Wet” Paint Process

We developed and are replicating a state-of-the-art “3-Wet” vehicle paint process, which reduces CO<sub>2</sub> emissions by 15 to 25 percent and volatile organic compound emissions by 10 percent compared to either conventional, high-solids, solvent-borne or waterborne painting systems.

The process is called “3-Wet” because the advanced chemical composition of the paint materials used allows for the three layers of paint – primer, base coat and clear coat – to be applied while each layer is still wet, eliminating the stand-alone primer application and dedicated oven required in the conventional painting process. The 3-Wet process also saves the electricity used by the blowers that are typically needed to circulate massive volumes of air through paint booths, and reduces the amount of natural gas needed to heat the air and ovens.

In addition to these environmental benefits, this process maintains industry-leading quality and reduces costs. For example, 3-Wet reduces the time needed to paint a vehicle body by 20 to 25 percent, which translates to a significant cost reduction. Ford’s laboratory tests also show that the high-solids, solvent-borne paint used in the 3-Wet process provides better long-term resistance to chips and scratches than waterborne paint systems.

Ford initially implemented the 3-Wet process at our Ohio Assembly Plant in 2007 in the U.S. Since then, we have expanded implementation across our global operations when we build new facilities or refurbish existing ones. We now use the 3-Wet system at 12 of our facilities globally, including at plants in the U.S., Spain, India, Romania, Mexico, China and Thailand. Additional conversions to the 3-Wet process will be considered for plant refurbishment actions being planned in line with our corporate business plan.

## Heat Recovery Systems

At our Cologne and Saarlouis Assembly Plants in Germany, we are recovering and using heat from paint oven exhaust stacks, air recirculation systems and paint spray booths by incorporating heat pump technology. We are also recovering waste heat from the air compressor plant to preheat the paint phosphate tank, and making modifications to the plant heating and ventilation systems to establish better air recirculation control and temperature control. The Cologne paint oven exhaust stack system has already returned 15 GWh since it began operation in October 2013. Heat recovery projects currently underway will deliver around 150 GWh of energy savings per year from 2015 onward.

## Parts Washing Systems

A new parts-washing system developed in partnership with our supplier, ABB Robotics, represents a significant leap forward in energy efficiency and also improves quality, flexibility, productivity and cost. Conventional parts-washing systems remove dirt chemically by spraying parts with high volumes of water and detergent at low pressure. Our new system, in contrast, cleans parts mechanically by moving them in front of specialized high-pressure nozzles using a robotic arm. We are now using this technology as standard for all engine and transmission final wash applications globally, ensuring that the energy and cost savings will be realized by all future vehicle programs.

## Reducing Energy Use Through Better Information and Management Systems

We are continuing to roll out a Global Departmental-Level Metering (GDLM) initiative to collect electricity and natural gas and water consumption data at the plant level for all Ford plants globally, down to the department level. We use this near-real-time information to create energy-use profiles for plants and to improve decisions about nonproduction shutdowns and load shedding, which involves shutting down certain prearranged electric loads or devices when we reach an upper threshold of electric usage.

We are also upgrading and standardizing our building management systems to a new global standard. These information management initiatives will provide common reporting tools linked with production and other data sets, with facility maintenance and control systems. These efforts will greatly improve the amount of energy data we have, as well as the speed and quality of our energy analyses, which will help us identify energy-reduction opportunities more effectively and reduce the time required to make system changes.

In North America, we continue to use energy performance contracting as a financing tool to upgrade and replace infrastructure at our 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 lighting systems, paint-booth process equipment and compressed air systems, and to significantly reduce the use of steam in our manufacturing facilities. We are also expanding the use of performance contracting to global facilities using global supplier partners to help us meet our 25 percent energy-efficiency improvement target.

## Other Efforts to Improve Energy Efficiency in Our Plants

Where possible, we are also taking the following actions at our plants around the world:

- Aggressively curtailing energy use during nonproduction periods, including a paint shop emissions abatement equipment shutdown plan at nine North American assembly plants that reduces energy use and related CO<sub>2</sub> emissions by approximately 5,000 metric tons per facility per year
- Installing optimized compressed air machines, which are a significant energy user in

manufacturing facilities

- Installing automated control systems on plant powerhouses and wastewater treatment equipment to increase energy and process efficiency

**READ MORE:**

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*Ford takes a holistic approach to the issue of climate change.*

> [Climate Change](#)

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*Read more about how we manage environmental issues in our operations.*

> [Operations Environmental Management](#)

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1. Our Louisville Assembly is excluded from this program because it was not operating in 2011.
  2. We calculate plant-level energy intensity slightly differently at different plants, depending on the operations performed there. Depending on the plant, Ford will calculate energy intensity in terms of source energy consumed (in million Btus) divided by the number of vehicles produced, number of engines produced, or number of powertrain components produced. The percent change in energy intensity is tracked for each facility on both a monthly and annual basis. Ford normalizes its plant-level numbers to account for changes in production volume and heating and cooling degree days. These metrics are rolled up to the corporate level, with a corporate-wide percent improvement in energy intensity calculated by taking a weighted average of the percent change in energy intensity at the individual facilities.

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# GHG Emissions Reporting and Trading

Our participation in reporting, emissions-reduction and trading schemes has played an important role in accelerating our facilities' greenhouse gas (GHG) emissions-reduction activities. These activities have helped us build a world-class carbon dioxide (CO<sub>2</sub>) tracking infrastructure for our facility emissions, which we now use to measure progress against our new facility CO<sub>2</sub> target, support mandatory and voluntary reporting globally, support emissions trading efforts, and ensure compliance with the EU Emissions Trading System and the mandatory U.S. Environmental Protection Agency (EPA) reporting requirements.

## Emissions Reporting

Since 2010, Ford has been officially "Climate Registered" by publishing its complete North American carbon inventory with The Climate Registry (TCR), a voluntary carbon-disclosure initiative that links several state-sponsored GHG emissions-reporting efforts, including the California Climate Action Registry and the Eastern Climate Registry. Ford was the first automaker to join TCR and is one of only two automakers to be officially Climate Registered. 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 the TCR's General Reporting Protocol.

Globally, we were the first automaker to commit to voluntarily report our GHG emissions in India and the first automaker to participate in GHG reporting initiatives in China, Australia and Mexico. We also voluntarily report GHG emissions in the U.S., Canada, Argentina, Brazil, Taiwan and Venezuela.

In the U.S., many of our facilities are subject to EPA GHG reporting requirements and submit reports as required. This EPA program requires the submission of annual GHG emissions reports by 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.

## Emissions Trading

Emissions trading is a key tool in both voluntary and mandatory GHG emissions-reduction programs. Ford was an early participant in carbon markets, with a goal of gaining experience that will be valuable in an increasingly carbon-constrained world.

In 2003, for example, Ford – along with 11 other companies and the city of Chicago – founded the Chicago Climate Exchange (CCX), a GHG emissions-reduction and trading program for emission sources and projects in North America. Ford was the first and only

auto manufacturing participant in the Exchange. The CCX elected to end the emissions-trading portion of the program after 2010, with cumulative verified emission reductions totaling nearly 700 million metric tons of CO<sub>2</sub> since 2003.

Ford was also one of the original companies to join the U.K. Emissions Trading Scheme, the first voluntary, government-sponsored, economy-wide, cross-industry GHG trading program. Ford Motor Company Limited (U.K.) entered the program in March 2002, committing to and achieving a 5 percent CO<sub>2</sub> reduction for eligible plants and facilities over five years.

Ford now participates in the mandatory EU Emissions Trading System, which commenced in January 2005. Despite Ford facilities' low-to-moderate CO<sub>2</sub> emissions (compared to other industry sectors), the EU Emissions Trading System regulations apply to six Ford facilities in the U.K., Belgium and Spain. The trading scheme requires us to apply for emissions permits, meet rigid emissions monitoring and reporting plans, arrange for third-party verification audits and manage tax and accounting issues related to emissions transactions.

In the U.K., Ford also now participates in the Carbon Reduction Commitment, a mandatory emissions trading scheme aimed at commercial energy users not covered under the EU Emissions Trading Scheme. The Commitment covers direct emissions from gas use and indirect emissions from electricity use from 77 Ford dealerships and 11 Ford office and logistics sites. Participants need to report emissions annually and purchase all emissions allowances from the U.K. government each year.

In 2014, China introduced a rule called the Interim Measures of Carbon Emissions Trading Rights in Chongqing, and emissions trading is expected to commence in 2015. Similar to the EU Emissions Trading Scheme, under this rule Ford will be required to arrange for third-party verification audits and manage accounting issues related to emissions transactions.

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# Dealership Energy Efficiency

We are continuing to expand the “Go Green” Dealer Sustainability Program we launched in 2010. The goal of the Go Green program is to address efficiency improvements and cost savings at dealerships in the areas of lighting, HVAC, building envelope, water use and renewable energy applications. To enter the program, dealers undergo a Go Green Assessment, which identifies opportunities to increase their utility efficiencies, lower their energy costs and reduce their carbon footprints.

Ford’s Go Green Group, part of our Energy Team, prepares the Go Green Assessments, makes recommendations to dealers regarding cost-effective ways to improve the energy and utility efficiency of their facilities, and provides ongoing technical assistance to dealerships. The Go Green Group completes the Assessments using global leaders in energy consulting. The Group also provides utility efficiency guidelines to dealerships that are developing new facility plans and reviews completed dealership plans, making recommendations for improvement, if needed.

As of the end of 2014, nearly half of our 3,263 U.S. dealers had enrolled in the Go Green program as part of the electric vehicle (EV) and “Trustmark” programs. Completion of the first 270 Assessment reports identified that the average dealership has the opportunity to reduce their energy consumption by 27 percent, resulting in an annual savings of \$33,000 with a payback of 3.5 years.

During 2015, Ford will continue to complete the Go Green Assessments, encourage dealerships to implement green recommendations, provide ongoing technical support and recognize dealerships that have achieved significant energy reductions.

In 2014, we also launched a new wind energy program for select EV dealers in partnership with Wind Energy Corporation. Under a pilot program exclusive to Ford, Wind Energy will install wind sail and solar panel systems at four Ford dealerships, a nearly \$750,000 investment. Each Windy System™ includes highly efficient wind sail technology that harvests wind energy, along with an integrated 7 kw solar array. Ford dealers will use the electricity to power their buildings, EV charging stations and lot lighting. The system is expected to deliver 20,000 kWh of electricity annually and offset nearly 14 tons of greenhouse gases per year. The installations are occurring in 2015.



Ford is working with Wind Energy to install wind sail and solar panel systems at four Ford dealerships. Each system is expected to deliver enough electricity to power two average-sized homes for a year.

**READ MORE:**

[Read more about how we work with](#)

[Ford and Lincoln dealers play an](#)

and support our dealers.

> [Working with Ford – Dealers](#)

important part in Ford's community  
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# Renewable Energy

Ford is actively involved in the installation, demonstration and development of alternative sources of energy. We also purchase renewable energy from utilities. In 2014, Ford directly produced 1 percent of our energy using renewable infrastructure and purchased an additional 17 percent from our utility partners.

## North America

In 2014, in partnership with DTE Energy, we began construction of Michigan's largest solar array at Ford World Headquarters. The project, funded by DTE Energy, will include a solar-topped carpark to provide employees with covered parking spaces and charging stations for plug-in electric vehicles.

Other examples of renewable energy at our North American facilities include the following:

- At our Rouge Visitor Center in Dearborn, Michigan, we installed a photovoltaic array and solar thermal collector.
- 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 and eliminates the emission of 4,300 metric tons of carbon dioxide (CO<sub>2</sub>) each year.
- At our Michigan Assembly Plant we partnered with DTE Energy and the state of Michigan to build a solar photovoltaic array to provide power to the plant and to build an energy storage system to store energy produced by the solar array until it is needed. The energy is stored in a large battery system that in turn recharges electric material-handling vehicles used on-site.
- The Michigan Assembly Plant also uses methane released from decaying trash at a nearby landfill to heat one of the buildings on-site, which reduces emissions of this potent greenhouse gas.
- At our Michigan Proving Grounds in Romeo, Michigan, we installed a solar-powered trash compactor that compresses waste more efficiently than the previous one. The resulting compacted waste is sent to an incinerator where it is converted into power for local residents.
- In Mexico, Ford's Hermosillo Stamping and Assembly Plant purchases solar energy produced from a local solar farm totaling about 8 million kWh per year of solar energy, or about 6 percent of the facility's total energy requirements. The solar energy reduces indirect emissions from the facility by more than 4,600 tons of CO<sub>2</sub> per year.

# 18%

of our total energy use in 2014 was generated from renewable sources including 1% generated directly by Ford and 17% purchased from utility partners.

## Europe

Ford's Dagenham Diesel Engine Assembly line in the U.K. was the first automotive plant in the world to obtain all of its electrical energy needs from two on-site wind turbines, which have been in operation since 2004. A third 2 megawatt wind turbine was installed in 2011.

Ford's U.K.-based 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<sub>2</sub> emissions annually.

Since 2008, we have been sourcing renewable electricity to cover the full electric-power demand of our manufacturing and engineering facilities at our Cologne Plant in Germany. Through this initiative, the company has reduced its CO<sub>2</sub> emissions by 190,000 metric tons per year. In 2012, a 1 megawatt photovoltaic installation on the roof of the Ford Customer Service Division warehouse in Merkenich was installed, contributing further to our renewable-energy efforts.

In Wales, Ford's Bridgend Engine Plant was the first car manufacturing plant in Europe retrofitted with an integrated, grid-connected solar/photovoltaic installation. The system has been in operation since 1998. A 500 kW wind turbine has also recently been commissioned at the Bridgend site.

## Asia Pacific

In India, we have been using solar thermal heating at the Chennai plant to heat water for cooking in the main cafeteria since 2011. Using this system, sterilized water is pumped through thermal solar panels and then taken to the cafeteria for cooking. This system has reduced boiler diesel consumption by approximately 420 liters per day. The system is expected to pay for itself in four years.

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# Non-CO<sub>2</sub> Facility Emissions

Volatile organic compounds (VOCs) are a significant aspect of Ford’s manufacturing operations due to the size and number of paint shops that we operate. In this section, we discuss how we are reducing VOC emissions at our facilities. We provide data on other non-carbon-dioxide (CO<sub>2</sub>) facility emissions in the [Climate Change and Environment Data](#) section.

Since 2000, Ford’s North American operations have cut VOC emissions associated with the painting process (by far our largest source of VOC emissions) by 50 percent. In 2014, these operations emitted 16.8 grams of VOCs per square meter of surface coated, the same as in 2013. Emissions remained the same, rather than going down, due to the large number of new product launches in 2014. 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.

Ford developed a Paint Emissions Concentrator (PEC) technology (formerly referred to as “fumes-to-fuel”), which uses a fluidized bed adsorber and desorber and condensation equipment to collect and concentrate solvent emissions into a liquid. The intent of the technology is to collect a portion of the VOCs from the spray-booth exhaust, super-concentrate them in the PEC, then condense and store them on-site for use as fuel source. In this way, the solvent emissions are recycled back into the production process and overall VOC emissions are reduced. We are currently using this technology at our Oakville facility.

Our PEC technology has the potential to reduce CO<sub>2</sub> emissions by 70 to 80 percent compared to traditional abatement equipment. PEC technology coupled with the recycling of collected solvents also has the potential to eliminate nitrogen oxide emissions compared to conventional abatement approaches, which involve the oxidation of the solvents. In addition, there is potential to reform the captured VOCs into hydrogen, which could be used as a fuel for fuel cells. We are working with a Canadian company to advance the PEC technology and evaluate the potential for producing and using hydrogen fuel.

We are also continuing to use an innovative new windshield attachment process that reduces VOC emissions. The typical method to attach a windshield – used currently at Ford and throughout the industry – is to first wipe the glass with a solvent cleaner, and then apply a primer and adhesive to secure the windshield to the vehicle. However, this method releases a small amount of highly undesirable solvent emissions. Ford’s new patented technology eliminates the use of the solvents that contain VOCs and simplifies the manufacturing process by reducing steps, such as wiping the glass clean. Ford is working with Plasmatrete, an Illinois-based supplier, to implement the technology. The technology will be offered worldwide, first in equipment that Plasmatrete plans to sell or lease to Ford, then to other automakers, the heavy-truck market, the motorhome and bus industries, and other customers who want to use it.

Finally, we are reducing VOC emissions with an innovative paint process called [“3-Wet”](#). This process reduces VOC emissions by 10 percent and has other environmental, financial and quality benefits.

**READ MORE:**

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[Emissions \(VOC and Other\)](#)

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# Water Use

Water conservation is an integral part of Ford’s sustainability strategy. Many vehicle manufacturing processes require water, and water is used at every point in our supply chain.

### READ MORE:

*We discuss our global water strategy, water-related risks and opportunities, and our progress in reducing water use in our operations*

> [Water](#)

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# Waste Management

We have set goals to reduce the amount and toxicity of manufacturing-related wastes and ultimately eliminate the disposal of waste in landfills.

In 2013, we introduced a new plan to reduce waste sent to landfill by 40 percent on a per-vehicle basis between 2011 and 2016 globally. This goal builds on our previous achievement of reducing global per-vehicle waste to landfill by 40 percent from 2007 to 2011. In 2014, Ford facilities globally sent approximately 39,000 metric tons of waste to landfill, a reduction of 21 percent from 2013.

In 2014, Ford facilities globally generated approximately 48,000 metric tons of hazardous waste, which is an increase of 11.4 percent compared to 2013. Hazardous waste on a per-vehicle basis increased by 13 percent compared to 2013, but decreased by 10 percent over the last five years. Hazardous wastes are defined by regulation in each country in which Ford operates. The increase in our hazardous waste amounts in 2014 is due to the launch of plants in China and the Chinese regulatory definition of hazardous waste. 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.

On this page:

- ↓ [Increasing Our Zero-Waste-to-Landfill Plants](#)
- ↓ [Waste-Reduction Technologies and Programs](#)

### Closed-Loop Recycling on the All-New F-150

In 2014, we implemented closed-loop recycling processes as part of the manufacture of the all-new Ford F-150. Through these programs, described in more detail in a case study, we return production scraps of aluminum and seat fabric directly to suppliers to be recycled into new material. Between 30 and 40 percent of a typical aluminum coil is turned into scrap during the stamping process. This will now be recycled into new metal for our trucks using the closed-loop system.

 [Spotlight: Reinventing the Ford F-150](#)

Ford's five-year global waste-reduction plan details how the company will lessen its environmental impact.

## Five Key Actions

### 1. Invest

Continue investing in new technologies and programs that minimize waste

### 2. Standardize

Standardize how waste is tracked and sorted at each point to make recycling and reuse easier

### 3. Identify

Identify the five largest-volume

### 4. Partner

Partner with suppliers to increase the use of eco-friendly packaging

### 5. Enable

Enable local plants to effect waste management change



### Current Waste Mix

- Wastewater sludge
- Recovered paint solids
- Packaging waste
- Used oils and waste solvent
- Grinding swarf (metallic particles, abrasives and oils)
- Other wastes

Ford has reduced waste to landfill per vehicle produced by more than

**50 percent**  
over the last five years.

## Increasing Our Zero-Waste-to-Landfill Plants

Twenty-six Ford facilities have achieved our stringent definition of zero waste to landfill (ZWTL):<sup>1</sup>

### Asia Pacific Region

- Chennai Assembly (ZWTL since 2012)
- Chennai Engine (ZWTL since 2012)
- Ford Thailand Manufacturing (ZWTL since 2013)
- JMC Xiaolan (ZWTL since 2013)
- Lio Ho

### Ford of Europe

- Bordeaux Transmission (ZWTL since 2013)
- Cologne Assembly (ZWTL since 2012)
- Cologne Cotarko (ZWTL since 2012)
- Cologne Die Cast (ZWTL since 2012)
- Cologne Engine (ZWTL since 2012)
- Saarlouis Assembly (ZWTL since 2012)
- Valencia Engine

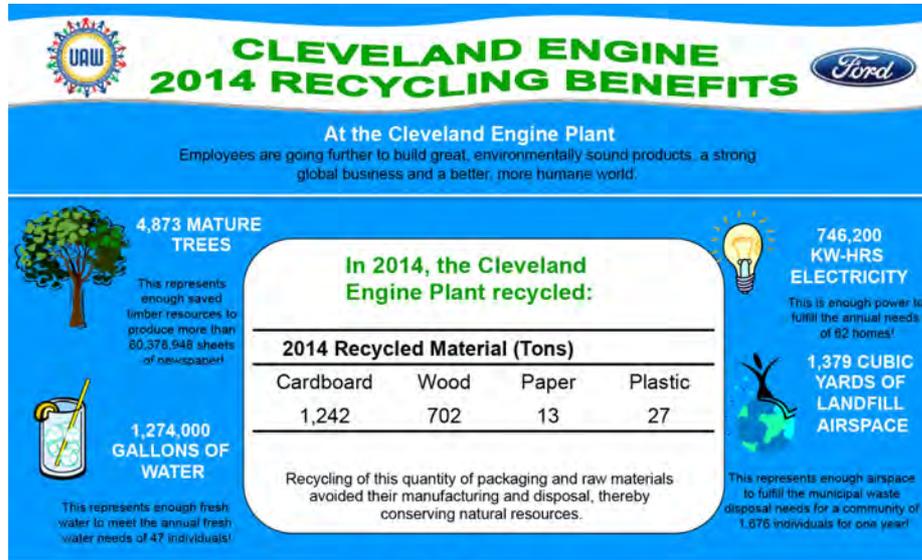
### North America

- Chihuahua Engine 1 and 2
- Cuautitlán Assembly
- Engine Manufacturing Development Operations/Beech Daly Technical Center (ZWTL since 2013)
- Essex Engine (ZWTL since 2012)
- Michigan Proving Ground (ZWTL since 2013)
- Oakville Assembly Complex
- Rawsonville (ZWTL since 2013)
- Research and Engineering Center
- Van Dyke Transmission (ZWTL since 2012)
- Windsor Engine (ZWTL since 2013)

## South America

- Camaçari Engine
- Taubaté Transmission
- Taubaté Engine

We are also improving the way we communicate our waste-reduction success to employees as part of an effort to engage employees in further waste-reduction improvements. We are reporting not just waste-reduction and recycling totals, but how these numbers translate into more meaningful impacts, such as number of trees saved. An example of one of these communications is provided below.



### DID YOU KNOW...

The Cleveland Engine Plant sends its grinding swarf (the metallic residue from machining operations) to a scrap metal recycler, and its used coolant filters to a plastic recycler, keeping over 2 million pounds of waste from going to landfill.

## Waste-Reduction Technologies and Programs

We are using a variety of waste-reduction technologies and programs across our plants to help us meet our waste-reduction goals and operate ever more efficiently. Some examples of our waste-reduction efforts include the following:

- We continue to implement our minimum quantity lubricant (MQL) machining process (also called “near-dry machining”), which reduces waste by more than 80 percent for each engine we produce, and also [saves water](#) and oil. We have now implemented this process at six plants in North America, Asia and Europe.
- Five of our plants in the U.S. send paint sludge to DTE Energy to be recycled. In 2014, this eliminated more than 1,300 tons of waste that would otherwise have been sent to a landfill.
- In 2014, two of our plants in China – CAF Chongqing 1 and Chongqing 2 – began using a non-landfill treatment method for their wastewater treatment plant sludge that removes 2,800 metric tons of waste from landfill annually.
- At many of our plants, including our Chennai Assembly Plant in India, we have reduced packaging waste by using returnable and reusable packaging materials.
- We continue to recycle grinding swarf at U.S. and Canadian facilities. This process can eliminate up to 3 million pounds of waste sent to landfill each year.

### READ MORE:

*Read more about our performance in reducing waste from our operations.*



## Waste

*The new F-150 is Ford's toughest, most capable – and most sustainable – truck ever.*

 **Spotlight: Reinventing the Ford F-150**

- 
1. Waste to landfill is defined as all production waste sent to landfill, excluding episodic waste and construction and demolition debris. Scrap metal is not included in waste to landfill.

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# Sustainable Land Use and Biodiversity

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.

The construction and operation of our facilities for manufacturing, research, testing and administration have direct impacts on land. We are working to reduce the land use and biodiversity impacts of these facilities and to improve biodiversity and wildlife habitat on their land.

A highly visible example of Ford's commitment to sustainability can be seen on more than 70 acres of Ford-owned land throughout southeast Michigan, which is adorned with sunflowers and native prairie plantings. These plantings provide habitat for wildlife such as white-tailed deer, red fox, wild turkeys and coyote. Also, by replacing what otherwise would be traditional turf grass, the company saves approximately 30 percent on the costs of labor, gas and fertilizer. We use native plants in our landscaping whenever possible, as they are better adapted to local conditions and provide food and shelter for wildlife.

We continue to recycle our landscaping debris as compost in Ford-owned farm fields throughout southeast Michigan. By allowing our leaves, grass and plant clippings to collect and decompose throughout the summer, we are able to add more than 3,000 cubic yards per year of nutrient-rich compost to our fields in lieu of synthetic, petroleum-based fertilizer.

We are also installing "smart" irrigation systems at some of our Dearborn (Michigan) properties. These systems use site conditions – such as soil and plant types, evapotranspiration rates and local weather data – to program watering only when it is needed. To date, systems at 54 sites have been completed and are providing water savings of just over 30 percent. Many of these systems have reduced water usage at their site by nearly 60 percent since installation.

We are reducing emissions produced in normal lawn maintenance by using propane-fueled mowers, which produce approximately 24 percent fewer greenhouse gas emissions, 20 percent fewer nitrogen oxide emissions, and 60 percent less carbon monoxide than gasoline-powered mowers. Fairlane Grounds, which provides lawn-mowing services at Ford facilities in the Dearborn area, already operates 20 commercial-grade propane mowers, which is more than one-third of our main mower fleet. We will add another four propane mower units in 2015 as part of the scheduled fleet replacement, and will continue adding propane mowers until all of our regular-use mowers are propane powered.



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# Green Buildings

Ford is a leader in green building and is 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.

In the past, we have included green building design principles into our buildings on a case-by-case basis. To help standardize and broaden our efforts in this area, we are currently developing corporate specifications for building new facilities that will focus on sustainability. These specifications require that new manufacturing facilities be designed and constructed using the best practices for reducing water and energy use that Ford has developed at plants all over the world. These standards will become best practices across our global operations and will create efficient and sustainable plants. We are coordinating this effort through our Global Facilities Forum, described in the [Environmental Management section](#).

Ford is a member of the U.S. Green Building Council (USGBC) 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, and 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 has been working to achieve LEED certification of existing buildings since 1999. The LEED v3 Green Buildings, Operations and Maintenance rating system, or LEED GBOM, helps building operators measure operations, improvements and maintenance on a consistent scale. The standards are intended to promote healthy 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.

We are now in the process of seeking LEED EBOM (Existing Buildings: Operations and Management) certification for our Research and Innovation Center (RIC) in Dearborn. In February 2015, RIC complete the “performance period” of the process and submitted for certification review. Pending this review, we hope to receive certification by the end of 2015. During this period, actual building performance was measured for over three months to document that the energy and water efficiency, waste reduction, a sustainable material usage programs adhered to LEED and other relevant standards.

Based on these experiences, Ford is planning to seek certification of the balance of our portfolio of U.S. commercial office buildings through the USGBC’s LEED for EBOM Volume Program. We are initially working to certify 25 buildings in Dearborn, Michigan, through this program. We hope to complete this certification process in 2015.

Ford is also 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.

We are also working with our dealers to help them improve the environmental performance of their facilities.

Also see:

> [Dealership Energy Efficiency](#)

## Examples of Green Building Projects

The following are some examples of Ford's recent green building projects.

### Ford World Headquarters Green Roof – Dearborn, Michigan

In 2012, we refurbished a portion of the roof on our corporate world headquarters building in Dearborn, Michigan. As part of this effort, we installed 5,000 square feet of green roof on the building. This “living roof,” which is made from multiple varieties of sedum plants, helps to reduce storm water runoff from the building. In 2014, we began installing Michigan's largest solar array as part of a parking area canopy.



*We installed 5,000 square feet of green roof on the Ford World Headquarters in Dearborn, MI.*

Also see:

> [Renewable Energy](#)

### Green Dealership – Dagenham Motors, Barking, United Kingdom

Ford's Dagenham Motors dealership in Barking, England, recently built an all-new “green” dealership using the latest environmentally friendly materials and a number of sustainable and energy-saving features. The facility includes new and used car showrooms and a service center.

Water use at the facility is reduced by capturing rainwater runoff from the roof and storing it in a 3,500-gallon underground tank that supplies water for washing cars and flushing toilets. The rainwater-harvesting tank includes a UV sterilization unit, as well as inline contaminate and particulate filters that enable the water to be suitable and hygienic for hand washing. In addition, waste oil from cars that have been serviced is reused for heating the premises by fueling an integrated used-oil burner on the site. In addition, a wind turbine was installed to generate up to 10 percent of the site's electricity, and the facility used green construction practices.

### 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 was 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 storm water management system that includes bioswales and porous pavement to slow and cleanse the water. The Dearborn Truck Plant also features abundant skylights to maximize daylight in the facility. And, the Rouge Center features 100 acres of sustainable landscaping to help restore soils and support wildlife habitat.



*As part of our "greening" of the Ford Rouge Center, we redesigned the Dearborn Truck plant to be a model for sustainable manufacturing featuring a 10.4 acre "living roof".*

## Rouge Visitor Center (LEED-Gold)

The redeveloped Ford Rouge Center includes the LEED-Gold certified Rouge Visitor Center, a 30,000-square-foot facility featuring two multiscreen theaters and an observation deck. The facility captures rainwater for plumbing and irrigation and uses photovoltaic solar panels to produce energy. In addition, "green screens" of shading vines cover some parts of the building to reduce energy use.

## Corporate Crossing (LEED-EB)

In 2011 we achieved LEED Existing Building certification for our Corporate Crossing office building, located in Dearborn, Michigan. This was the first Ford facility to achieve this LEED rating.

## 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 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.

### READ MORE:

- > [Operational Energy Use and Greenhouse Gas Emissions](#)

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# Compliance

## Manufacturing Plants Notices of Violation

Ford received six notices of violation (NOVs) from government agencies in 2014, all in the U.S. The issuance of an NOV is an allegation of noncompliance with anything from a minor paperwork requirement to a permit limit, and does not mean that the company was noncompliant or received a penalty.

## Off-Site Spills

In 2014, no off-site spills occurred at Ford manufacturing facilities.

## Fines and Penalties Paid

In 2014, Ford paid no fines or penalties globally pertaining to environmental matters in our facilities.

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# Remediation

## Ringwood Mines Landfill Site

Ford Motor Company continues to address concerns raised in connection with Ford's prior disposal activities in Ringwood, New Jersey. Ford continues to work cooperatively with the Borough of Ringwood, the U.S. Environmental Protection Agency (EPA) and the New Jersey Department of Environmental Protection. In the fall of 2014, the EPA issued a Record of Decision (ROD) for the three soil areas requiring remediation. Ford has signed an Administrative Order on Consent that requires the remedies to be designed. The pre-design investigation work plan has been prepared for EPA approval. It is anticipated that EPA will finalize the groundwater ROD later this year.

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# Data

## Vehicle Fuel Economy and CO<sub>2</sub> Emissions

- > Ford U.S. Corporate Average Fuel Economy
- > Ford U.S. CO<sub>2</sub> Tailpipe Emissions per Vehicle (Combined Car and Truck Fleet Average CO<sub>2</sub> Emissions)
- > Ford Europe CO<sub>2</sub> Tailpipe Emissions per Passenger Vehicle
- > Ford Europe CO<sub>2</sub> Tailpipe Emissions per Light Commercial Vehicle
- > Ford Switzerland CO<sub>2</sub> Tailpipe Emissions per Passenger 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<sub>2</sub> Emissions

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- > North America Volatile Organic Compounds Released by Assembly Facilities
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## Waste

- > Regional Waste to Landfill
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- > Hazardous Waste Generation per Vehicle

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- > Global Water Use per Vehicle Produced
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# Data: Vehicle Fuel Economy and CO<sub>2</sub> Emissions

Data on this page:

- A. ↓ [Ford U.S. Corporate Average Fuel Economy](#)
- B. ↓ [Ford U.S. CO<sub>2</sub> Tailpipe Emissions per Vehicle \(Combined Car and Truck Fleet Average CO<sub>2</sub> Emissions\)](#)
- C. ↓ [Ford Europe CO<sub>2</sub> Tailpipe Emissions per Passenger Vehicle](#)
- D. ↓ [Ford Europe CO<sub>2</sub> Tailpipe Emissions per Light Commercial Vehicle](#)
- E. ↓ [Ford Switzerland CO<sub>2</sub> Tailpipe Emissions per Passenger Vehicle](#)

## A. Ford U.S. Corporate Average Fuel Economy

Miles per gallon

	2009	2010	2011	2012	2013	2014
<b>Cars (domestic and import)</b>	31.2	32.6	32.7	35.7	36.4	<b>36.4</b>
<b>Trucks</b>	24.6	24.1	24.2	24.3	25.0	<b>25.0</b>
<b>Combined car and truck fleet</b>	27.1	26.9	27.8	30.0	29.5	<b>30.1</b>

Third party rating

Data notes and analysis:

In 2014, the average fuel economy of our U.S. car fleet and U.S. truck fleet both remained unchanged compared to 2013. However, our combined corporate average fuel economy improved by about 2 percent due to increased customer demand for cars versus trucks. Our combined fleet CO<sub>2</sub> emissions improved by 9 percent compared to 2009.

Also see:

- > [Vehicle Fuel Efficiency and CO<sub>2</sub> Emissions Progress and Performance](#)

## B. Ford U.S. CO<sub>2</sub> Tailpipe Emissions per Vehicle (Combined Car and Truck Fleet Average CO<sub>2</sub> Emissions)

Grams per mile

	2009	2010	2011	2012	2013	2014
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 Reported to regulatory authorities ([Environmental Protection Agency](#))

Data notes and analysis:

Improvement is reflected in decreasing grams per mile. This is the third year that the CO<sub>2</sub> data has come directly from Ford's official Greenhouse Gas report. Under the One National Program regulation, 2012 MY is the first year where a separate greenhouse gas compliance report is required, in addition to the annual CAFE report. The CO<sub>2</sub> value includes FFV credits, but does not include credits/debits for air conditioning or off-cycle technologies or CH<sub>4</sub>/N<sub>2</sub>O compliance.

Also see:

> [Vehicle Fuel Efficiency and CO<sub>2</sub> Emissions Progress and Performance](#)

### C. Ford Europe CO<sub>2</sub> Tailpipe Emissions per Passenger Vehicle

Grams per kilometer

	2009	2010	2011	2012	2013	2014
Phase in of percent best-CO <sub>2</sub> -performing vehicles	139	128	130	116 <sup>3</sup>	111.5 <sup>2</sup>	113.9 <sup>1</sup>
100 percent of vehicles	139	128	132	129	129	122

 Reported to regulatory authorities ([Environmental Protection Agency](#))

Data notes and analysis:

1. 2014 values are preliminary data published by the European Commission (EC) publishes preliminary. Official data will be published by European Commission in the fourth quarter of 2015. Only 80 percent of the best-CO<sub>2</sub>-performing fleet vehicles are accounted for in the 2014 "phase in" data as part of the EC's phase in plan.
2. For 2013, final official data from the European Commission (EC) was published October 2014 for passenger cars (vehicle category M1). Only 80 percent of the best-CO<sub>2</sub> performing fleet vehicles are accounted for in 2013 "phase in" data as part of the EC's phase in plan.
3. Only 65 percent of the best-CO<sub>2</sub>-performing fleet vehicles are accounted for in the 2012 "phase in" data as part of the EC's phase in plan.

Improvement is reflected in decreasing grams per kilometer. "Phase in" data shows an increase in grams per kilometer from 2013 to 2014 because it includes a higher percentage of the vehicle fleet as directed by the EC's phase in plan, and therefore, includes more vehicles with lower CO<sub>2</sub> performance than were included in the 2013 "phase in" data. These figures are based on production data for European markets. European and U.S. fleet CO<sub>2</sub> 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<sub>2</sub> emissions as a percent of a 1995 base to reporting actual fleet average CO<sub>2</sub> emissions, to parallel our reporting for other regions.

Also see:

> [Vehicle Fuel Efficiency and CO<sub>2</sub> Emissions Progress and Performance](#)

## D. Ford Europe CO<sub>2</sub> Tailpipe Emissions per Light Commercial Vehicle

Grams per kilometer

	2012	2013	2014
	175 <sup>3</sup>	176.7 <sup>2, 3</sup>	NA <sup>1</sup>

### Data notes and analysis:

1. No data are yet available for 2014. Official 2014 data will be published by European Commission in the fourth quarter of 2015. 2014 official CO<sub>2</sub> Monitoring start for light commercial vehicles (N1). Between 2014 to 2017 Phase in Rule applied by increasing fleet coverage starting with lowest CO<sub>2</sub> vehicles; starting 70 percent in 2014, 75 percent in 2015, 80 percent in 2016.
2. For 2013, final official data from European Commission (EC) were published October 2013 for light commercial vehicles (vehicle category N1). For 2013, 70 percent of the best-CO<sub>2</sub>-performing light commercial vehicles are accounted for in this data as part of the EC's phase in plan.
3. For the calendar years 2012 and 2013, the specific emissions targets are not binding. As a consequence, the 2012 data for light commercial vehicles should be considered incomplete.

Improvement is reflected in decreasing grams per kilometer. "Phase in" data shows an increase in grams per kilometer from 2012 to 2013 because it includes a higher percentage of the vehicle fleet as directed by the EC's phase in plan, and therefore, includes more vehicles with lower CO<sub>2</sub> performance than were included in the 2012 "phase in" data. Note: For the calendar years 2012 and 2013, the specific emissions targets are not binding. These figures are based on production data for European markets. European and U.S. fleet CO<sub>2</sub> 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<sub>2</sub> emissions as a percent of a 1995 base to reporting actual fleet average CO<sub>2</sub> emissions, to parallel our reporting for other regions.

Also see:

> [Vehicle](#)

## E. Ford Switzerland CO<sub>2</sub> Tailpipe Emissions per Passenger Vehicle

Grams per kilometer

	2012	2013	2014
Phase in of percent best-CO <sub>2</sub> -performing vehicles	124 <sup>3</sup>	122.7 <sup>2</sup>	126.0 <sup>1</sup>
100 percent of vehicles	139	134	135

 Reported to regulatory authority ([Swiss Federal Office of Energy](#))

### Data notes and analysis:

1. Swiss authorities (BFE) publishes final 2014 data. For 2014, 80 percent of the best-CO<sub>2</sub>-performing fleet vehicles are accounted for in this data, as part of the Swiss phase in plan.
2. For 2013, final official data from Swiss authorities (BFE) were published in April 2014 for passenger cars (vehicle category M1). For 2013, 75 percent of the best-CO<sub>2</sub>-performing fleet vehicles were accounted in this data, as part of the Swiss phase in plan.
3. The 2012 data only includes CO<sub>2</sub> monitoring for the second half of the year (Q3 & Q4). For 2012, 65 percent of the best-CO<sub>2</sub>-performing fleet vehicles were accounted for in this data, as part of the

Swiss phase in plan.

Improvement is reflected in decreasing grams per kilometer. “Phase in” data shows an increase in grams per kilometer from 2013 to 2014 because it includes a higher percentage of the vehicle fleet as directed by the EC’s phase in plan, and therefore, includes more vehicles with lower CO<sub>2</sub> performance than were included in the 2013 “phase in” data. CO<sub>2</sub> emissions for 100 percent of the vehicle fleet increased from 2013 to 2014 due to an increased percentage of non-diesel vehicles in the overall fleet, an increase in automatic vehicles over manual vehicles, and an increase in relatively higher CO<sub>2</sub> emission four-wheel drive vehicles. These figures are based on production data for European markets. European and U.S. fleet CO<sub>2</sub> 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<sub>2</sub> emissions as a percent of a 1995 base to reporting actual fleet average CO<sub>2</sub> emissions, to parallel our reporting for other regions.

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Also see:

> [Vehicle Fuel Efficiency and CO<sub>2</sub> Emissions Progress and Performance](#)

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Vehicle Fuel Economy and CO<sub>2</sub> Emissions

> **Tailpipe Emissions**

Operational Energy Use and CO<sub>2</sub> Emissions

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# Data: Tailpipe Emissions

Data on this page:

- A. ↓ [Ford U.S. Average NOx Emissions](#)
- B. ↓ [Ford U.S. Average NMOG Emissions](#)
- C. ↓ [Ford U.S. Average Vehicle Emissions](#)

## A. Ford U.S. Average NOx Emissions

	Grams per mile					
	2009	2010	2011	2012	2013	<b>2014</b>
Passenger cars	0.05	0.06	0.07	0.06	0.07	<b>0.06</b>
All light duty	0.05	0.06	0.08	0.07	0.07	<b>0.07</b>

 Reported to regulatory authorities ([Environmental Protection Agency](#))

Also see:

> [Non-CO<sub>2</sub> Tailpipe Emissions](#)

## B. Ford U.S. Average NMOG Emissions

	Grams per mile					
	2009	2010	2011	2012	2013	<b>2014</b>
Passenger cars	0.07	0.07	0.07	0.06	0.07	<b>0.08</b>
All light duty	0.07	0.08	0.08	0.07	0.07	<b>0.08</b>

 Reported to regulatory authorities ([Environmental Protection Agency](#))

Data notes and analysis:

NMOG = Non-Methane Organic Gases

Also see:

> [Non-CO<sub>2</sub> Tailpipe Emissions](#)

## C. Ford U.S. Average Vehicle Emissions

Grams per mile

	2009	2010	2011	2012	2013	<b>2014</b>
Passenger cars	0.12	0.13	0.14	0.13	0.13	<b>0.13</b>
All light duty	0.13	0.13	0.15	0.14	0.14	<b>0.15</b>

 Reported to regulatory authorities ([Environmental Protection Agency](#))

Data notes and analysis:

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.

Also see:

> [Non-CO<sub>2</sub> Tailpipe Emissions](#)

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# Data: Operational Energy Use and CO<sub>2</sub> Emissions

Data on this page:

- A. ↓ [Worldwide Facility Energy Consumption](#)
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- D. ↓ [Worldwide Facility CO<sub>2</sub> Emissions per Vehicle](#)
- E. ↓ [Energy Efficiency Index](#)

## A. Worldwide Facility Energy Consumption

Billion Kilowatt Hours

	2009	2010	2011	2012	2013 <sup>2</sup>	2014 <sup>1</sup>
<b>Direct</b>	8.7	8.4	7.9	6.8	7.7	<b>7.88</b>
<b>Indirect</b>	6.4	7.7	7.6	7.5	7.5	<b>7.06</b>
<b>Total</b>	15.1	16.1	15.5	14.3	15.2	<b>14.94</b>

Data managed through the [Global Emissions Manager database](#)

Data notes and analysis:

1. 2014 data shows two decimal places to avoid a rounding discrepancy in the total.
2. Data for 2013 direct energy and total energy has been restated to include Ford's Hermosillo Stamping and Assembly Plant, which was inadvertently excluded from the calculation in our prior year's report.

Also see:

> [Operational Energy Use and Greenhouse Gas Emissions](#)

## B. Worldwide Facility Energy Consumption per Vehicle

Kilowatt Hours per vehicle

	2009	2010	2011	2012	2013 <sup>1</sup>	2014
<b>Direct</b>	1,891	1,609	1,408	1,207	1,253	<b>1,303</b>
<b>Indirect</b>	1,381	1,478	1,370	1,332	1,213	<b>1,167</b>

<b>Total</b>	3,272	3,087	2,778	2,539	2,466	<b>2,470</b>
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 Data managed through the [Global Emissions Manager database](#)

Data notes and analysis:

Total energy use per vehicle deteriorated slightly in 2014 compared to 2013 (it increased by 0.2 percent) due to production changes, an increased number of operating facilities and colder weather, which increases the related energy demands.

1. Data for 2013 direct energy and total energy has been restated to include Ford's Hermosillo Stamping and Assembly Plant, which was inadvertently excluded from the calculation.

Also see:

> [Operational Energy Use and Greenhouse Gas Emissions](#)

## C. Worldwide Facility CO<sub>2</sub> Emissions

Million metric tonnes

	2009	2010	2011	2012	2013	<b>2014</b>
Direct	1.5	1.7	1.6	1.4	1.5	<b>1.5</b>
Indirect	3.1	3.6	3.5	3.4	3.3	<b>3.1</b>
<b>Total</b>	<b>4.6</b>	<b>5.2</b>	<b>5.1</b>	<b>4.8</b>	<b>4.8</b>	<b>4.6</b>

 Third party verified (North America and EU)<sup>1</sup>

 Reported to regulatory authorities (EU). Voluntarily reported to emissions registries or other authorities in Argentina, Australia, Brazil, Canada, China, Taiwan, the U.S and Venezuela

Data notes and analysis:

1. Verification data is not yet available for Ford's 2014 global facility GHG emissions. 100 percent of Ford's 2013 global facility GHG emissions are third-party verified to limited assurance. 73 percent of Ford's 2013 global facility GHG emissions are third-party verified to a reasonable level of assurance. In addition, all of our European facilities impacted by the mandatory EU Emissions Trading Scheme (EU-ETS) are third-party verified. All EU-ETS verification statements are provided to Ford, by facility, from Lucideon (formerly CICS) for UK facilities, Lloyds for Spain, Intechnica for Germany and SGS for Belgium. North American facilities are verified against the Climate Registry's General Reporting Protocol. European facilities are verified against the EU-ETS rules and guidelines.

Also see:

> [Operational Energy Use and Greenhouse Gas Emissions](#)

## D. Worldwide Facility CO<sub>2</sub> Emissions per Vehicle

Metric tons per vehicle

	2009	2010	2011	2012	2013	<b>2014</b>
--	------	------	------	------	------	-------------

Direct	0.35	0.31	0.28	0.25	0.24	<b>0.25</b>
Indirect	0.72	0.70	0.63	0.61	0.54	<b>0.51</b>
<b>Total</b>	<b>1.07</b>	<b>1.01</b>	<b>0.91</b>	<b>0.86</b>	<b>0.78</b>	<b>0.76</b>

 Data managed through the [Global Emissions Manager database](#)

Also see:

> [Operational Energy Use and Greenhouse Gas Emissions](#)

## E. Energy Efficiency Index

	Percent					
	2009	2010	2011	2012	2013	<b>2014</b>
	18.3	14.4	2.6	6.4	17.0	<b>21.0</b>

*Data notes and analysis:*

The energy efficiency index is a normalized indicator of energy used in our manufacturing facilities per vehicle produced based on a calculation that adjusts for typical variances in weather and vehicle production. The Index is set at 100 for the baseline year to simplify tracking annual improvements. In 2012, we expanded our energy efficiency to include global energy use data. In previous years, it only included energy use at North American facilities. In 2012, we also reset the baseline year to 2011. A year 2000 baseline was used through 2006; the baseline was reset to year 2010 starting in 2011. The year 2012 improvement indexed against the year 2011 baseline was 6.4, indicating a 6.4 percent improvement in global energy efficiency per vehicle from 2011 to 2012. Higher percentage reflects improvement. The year 2014 improvement indexed against the year 2011 baseline was 21, indicating a 21 percent improvement.

Also see:

> [Operational Energy Use and Greenhouse Gas Emissions](#)

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# Data: Emissions (VOC and Other)

Data on this page:

- A. ↓ [North America Volatile Organic Compounds Released by Assembly Facilities](#)
- B. ↓ [Ford U.S. TRI Releases](#)
- C. ↓ [Ford U.S. TRI Releases per Vehicle](#)
- D. ↓ [Ford Canada NPRI Releases](#)
- E. ↓ [Ford Canada NPRI Releases per Vehicle](#)
- F. ↓ [Australia National Pollutant Inventory Releases \(Total Air Emissions\)](#)

## A. North America Volatile Organic Compounds Released by Assembly Facilities

Grams per square meter of surface coated

	2009	2010	2011	2012	2013	<b>2014</b>
	21.0	21.6	20.4	18.0	16.9	<b>16.8</b>

Data managed through the [Global Emissions Manager database](#)

Also see:

- > [Non-CO<sub>2</sub> Facility Emissions](#)

## B. Ford U.S. TRI Releases

Million pounds

	2009	2010	2011	2012	2013	<b>2014</b>
	2.62	2.89	3.23	3.07	3.16	<b>NA</b>

Reported to regulatory authorities ([Environmental Protection Agency](#))

Data notes and analysis:

NA = Not available.

Releases reported under the U.S. Toxics Release Inventory (TRI) 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.

Also see:

> [Non-CO<sub>2</sub> Facility Emissions](#)

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## C. Ford U.S. TRI Releases per Vehicle

Pounds per vehicle

2009	2010	2011	2012	2013	2014
2.00	1.80	1.76	1.44	1.36	NA

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 Reported to regulatory authorities ([Environmental Protection Agency](#))

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Data notes and analysis:

NA = Not available.

Releases reported under the U.S. Toxics Release Inventory (TRI) 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.

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Also see:

> [Non-CO<sub>2</sub> Facility Emissions](#)

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## D. Ford Canada NPRI Releases

Metric tonnes

2009	2010	2011	2012	2013	2014
594	784	630	494	532	NA

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 Reported to regulatory authorities ([Environment Canada](#))

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Data notes and analysis:

NA = Not available.

Releases reported under the U.S. Toxics Release Inventory (TRI) 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.

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Also see:

> [Non-CO<sub>2</sub> Facility Emissions](#)

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## E. Ford Canada NPRI Releases per Vehicle

Metric tonnes per vehicle

2009	2010	2011	2012	2013	2014
0.0026	0.0024	0.0020	0.0019	0.0021	NA

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---

 Reported to regulatory authorities ([Environment Canada](#))

---

Data notes and analysis:

NA = Not available.

Releases reported under the U.S. Toxics Release Inventory (TRI) 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.

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Also see:

> [Non-CO<sub>2</sub> Facility Emissions](#)

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

Kilograms per year

2009	2010	2011	2012	2013	<b>2014</b>
345,910	480,872	249,686	239,778	581,239	<b>154,930</b>

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 Reported to regulatory authorities ([NPI](#))

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Data notes and analysis:

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.

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Also see:

> [Non-CO<sub>2</sub> Facility Emissions](#)

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## Climate Change and Environment

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# Data: Waste

Data on this page:

- A. ↓ [Regional Waste to Landfill](#)
- B. ↓ [Waste to Landfill per Vehicle](#)
- C. ↓ [Regional Hazardous Waste Generation](#)
- D. ↓ [Hazardous Waste Generation per Vehicle](#)

## A. Regional Waste to Landfill

*Million kilograms*

	2009	2010	2011	2012	2013	2014
Asia Pacific	9.5	7.4	7.9	8.8	8.2	3.1
Europe	11.7	11.4	9.6	7.7	7.5	6.4
North America	34.3	39.5	38.1	32.4	30.8	25.2
South America	7.7	7.6	6.6	3.8	3.3	2.0
Middle East & Africa	NA	NA	NA	NA	NA	2.4

Data managed through the [Global Emissions Manager database](#)

Data notes and analysis:

NA = Not available.

In 2014, we reorganized our operations into five regional business units: Asia Pacific, Europe, North America, South America, and Middle East & Africa. For 2009–2013, Middle East & Africa data is included in the Asia Pacific region, formerly the Asia Pacific Africa region. From 2014 forward, Middle East & Africa data will be reported separately.

Also see:

> [Waste Management](#)

## B. Waste to Landfill per Vehicle

*Kilograms*

	2009	2010	2011	2012	2013	2014
	15.2	13.3	11.3	9.4	8.1	6.5

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 Data managed through the [Global Emissions Manager database](#)

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Also see:

> [Waste Management](#)

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## C. Regional Hazardous Waste Generation

Million kilograms

	2009	2010	2011	2012	2013	2014
Asia Pacific	6.5	7.8	7.0	7.2	10.0	10.4
Europe	21.0	22.8	19.6	22.2	21.3	23.5
North America	7.7	8.9	9.4	8.9	8.0	9.3
South America	4.5	4.4	5.6	4.0	3.8	3.6
Middle East & Africa	NA	NA	NA	NA	NA	1.2

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 Data managed through the [Global Emissions Manager database](#)

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Data notes and analysis:

NA = Not available.

In 2014, we reorganized our operations into five regional business units: Asia Pacific, Europe, North America, South America, and Middle East & Africa. For 2009–2013, Middle East & Africa data is included in the Asia Pacific region, formerly the Asia Pacific Africa region. From 2014 forward, Middle East & Africa data will be reported separately.

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Also see:

> [Waste Management](#)

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## D. Hazardous Waste Generation per Vehicle

Kilograms

	2009	2010	2011	2012	2013	2014
	9.6	8.8	8.3	7.5	7.0	7.9

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 Data managed through the [Global Emissions Manager database](#)

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Also see:

> [Waste Management](#)

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# Data: Water

Data on this page:

- A. ↓ [Global Water Use per Vehicle Produced](#)
- B. ↓ [Global Water Use by Source](#)
- C. ↓ [Regional Water Use](#)
- D. ↓ [Re-use from On-site Wastewater Treatment Plant](#)
- E. ↓ [Process Wastewater Discharge](#)

## A. Global Water Use per Vehicle Produced

Cubic meters per vehicle produced

	2009	2010	2011	2012	2013	2014
	5.68	5.02	4.67	4.23	4.04	3.99

Data managed through the [Global Emissions Manager database](#)

Also see:

> [Water](#)

## B. Global Water Use by Source

Million cubic meters

	2009	2010	2011	2012	2013	2014
City water (includes surface and well water)	17.1	18.3	17.7	17.8	18.9	18.4
Surface water	2.0	1.7	1.7	0.8	0.8	0.8
Well water	5.3	6.2	6.2	5.1	5.2	4.9

Data managed through the [Global Emissions Manager database](#)

Also see:

> [Water](#)

## C. Regional Water Use

Million cubic meters

	2009	2010	2011	2012	2013	2014
Asia Pacific	3.4	3.6	3.5	4.0	4.8	4.1
Europe	6.0	6.6	6.6	5.8	6.1	5.9
North America	12.8	13.4	13.2	11.8	11.9	11.6
South America	2.4	2.5	2.4	2.1	2.1	1.9
Middle East & Africa	NA	NA	NA	NA	NA	0.5

 Data managed through the [Global Emissions Manager database](#)

Data notes and analysis:

NA = Not available.

In 2014, we reorganized our operations into five regional business units: Asia Pacific, Europe, North America, South America, and Middle East & Africa. For 2009–2013, Middle East & Africa data is included in the Asia Pacific region, formerly the Asia Pacific Africa region. From 2014 forward, Middle East & Africa data will be reported separately.

Also see:

> [Water](#)

## D. Re-use from On-site Wastewater Treatment Plant

Million cubic meters

	2013	2014
	0.98	1.0

 Data managed through the [Global Emissions Manager database](#)

Data notes and analysis:

In 2013, we began tracking process wastewater discharge and water re-used from on-site wastewater treatment plants.

Also see:

> [Water](#)

## E. Process Wastewater Discharge

Million cubic meters

	2013	2014
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 Data managed through the [Global Emissions Manager database](#)

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*Data notes and analysis:*

In 2013, we began tracking process wastewater discharge and water re-used from on-site wastewater treatment plants. Process wastewater discharge does not include re-use of stormwater or sanitary.

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Also see:

> [Water](#)

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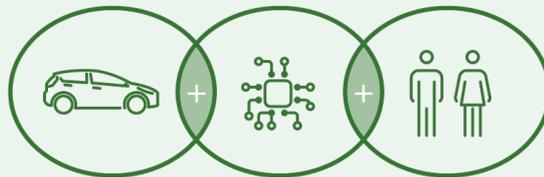
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# Spotlight: Reinventing the Ford F-150



*The new F-150 is Ford's toughest, most capable – and most sustainable – truck ever.*



Vehicles + Technology + People =  
a giant step forward in sustainability for a best-seller.

When it came time to update the F-150, Ford might have played it safe with incremental improvements. After all, Ford's F-Series line of full-size trucks has been America's best-selling truck for 38 years, and the best-selling vehicle of any kind for 33 years. Instead, we redesigned the 2015 F-150 from the wheels up, with major changes in design and materials that make it the toughest, smartest, most capable and fuel-efficient F-150 ever.

"Closed loop" aluminum and seat fabric recycling processes significantly reduce life-cycle waste and greenhouse gas emissions.

Increasing the amount of high-strength steel in the new F-150's frame from 22 percent to 77 percent and dramatically expanding the use of high-strength, military-grade, aluminum alloy in its body helped Ford engineers cut overall vehicle weight by up to 700 pounds. Yet



### Megatrend: Resource and carbon constraints

As both the developed and developing world continue to grow, innovation and ingenuity will be needed to overcome constraints in the availability of energy and raw materials.

> [Global Megatrends](#)

the new F-150 tows up to an additional 1,100 pounds, accelerates faster and brakes more quickly.

These and other smart engineering choices required Ford to redesign much of its production process – but the result was worth the investment. The all-new 2015 F-150 is not only the best performing but the most sustainable truck ever to roll off a Ford assembly line.

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*“We set out to create the future of tough with the new F-150. We achieved this goal while simultaneously delivering the highest EPA-estimated fuel economy ratings of any full-size gas-powered pickup in America.”*

Raj Nair

Ford Group Vice President, Global Product Development

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## Closed-Loop Recycling

Ford made a big investment in closed-loop recycling for the 2015 F-150, partnering with aluminum suppliers Novelis and Alcoa to recycle aluminum scraps from Ford's manufacturing process directly into aluminum for more F-150s. These scraps, most of which come from stamping windows into body panels, make up as much as 40 percent of the original metal used.

Aluminum is infinitely recyclable. Recycled aluminum requires 95 percent less energy than refining raw aluminum from bauxite, uses significantly less energy and water, and avoids the environmental impacts of mining virgin metal. But the aluminum scraps must be in pristine condition to be recycled into high-strength auto bodies. To achieve this level of purity, Ford invested \$60 million in special recycling equipment that keeps the aluminum scrap separate from other metals, divides it into six different alloys, cleans and shreds it, and sucks it into pneumatic tubes that lead to trucks dedicated solely to this process. Every day, about 50 semi-tractor trailers used to deliver fresh supplies of aluminum later drive away from Ford's F-150 plant in Dearborn, Michigan, filled with sorted aluminum alloys.

Once back at Ford's aluminum suppliers (which also invested in new technology for this process), the scraps are melted, impurities are removed, and the molten metal is remanufactured and shipped in large coils back to Ford stamping plants, where they go straight back into the manufacturing process from which they emerged. This approach is elaborate but extraordinarily efficient, preserving 90 percent of the original aluminum and reducing environmental impacts and costs. And it enabled the 2015 F-150 to become the first mass-assembly pickup ever produced with a high-strength, military-grade, aluminum alloy cargo box, closures, body structure.

The closed loop aluminum recycling process used in the F-150 received an inaugural Michigan Governor's Recycling Award, and earned the F-150 the top spot among pickups in the AAA's 2015 Green Car Guide. The Wall Street Journal described the 2015 F-150 as “perhaps the most important vehicle to hit Ford dealerships in decades.”

Ford works with a different supplier to develop another closed-loop recycling process in the 2015 F-150 and several other vehicles: waste material from seat fabric production is turned into new yarns that are woven back into the seat fabrics, keeping the scraps from the landfill. Since 2012, Ford has worked with Unifi and Sage Automotive to bring environmentally responsible, high-performance REPREVE® fiber to many Ford vehicles, like the 2015 F-150, Fusion and Edge. The recycled seat fabric fibers are made from 100 percent recycled material, like plastic bottles and post-industrial plastic waste. About 30

20-ounce plastic water bottles go into the seat fabric of each F-150 XLT. Overall, Ford's use of REPREVE® in the F-150 will divert more than 5 million plastic bottles from landfill in 2015 alone.

## Light-Weighting the New F-150

It seems intuitive that reducing a truck's weight would also reduce its toughness and performance. The all-new 2015 Ford F-150, which represents Ford's most extensive use of advanced lightweight materials ever, turns that expectation on its head.

Consider this: Increasing the use of high-strength steel in the F-150's frame makes it structurally more rigid while reducing weight by up to 60 pounds. Expanded use of high-strength aluminum alloys in the F-150's body improves dent and ding resistance while helping to reduce weight. These and other innovations make the 2015 F-150 up to 700 pounds lighter than its predecessor – while improving fuel efficiency, toughness and performance. Combined with EcoBoost® engine technology, the 2015 F-150 can tow up to 1,100 pounds and haul up to 530 pounds more than its 2014 counterpart, with a 5 percent to 16 percent better power-to-weight ratio. Overall, the 2015 models get from 5 percent to 29 percent better EPA-estimated fuel economy ratings than comparable 2014 models.<sup>1</sup>

Changes of this magnitude in a single year require bold thinking and design coupled with major investments in the right kinds of technology.

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1. EPA-estimated city fuel economy ratings for the 2015 F-150 lineup range from 15 mpg for the 5.0L Ti-VCT V8 to 19 mpg for the 2.7L EcoBoost V6. The highest estimated improvement of 29 percent is based on a comparison of the EPA-estimated combined fuel economy ratings for the all-new 2015 2.7L EcoBoost V6 4x2 (22 mpg) and the 2014 5.0L V8 4x2 (17 mpg).

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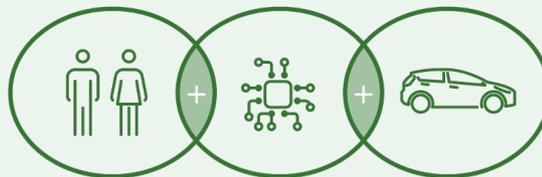
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## Spotlight: Ford Driving Skills for Life / Eco-Driving



*Ford provides tools, technology and training to help drivers perform their best.*



*People + Technology + Vehicles + Concerns about Safety and Climate = tools, technology and training for safer roads and lower emissions*

Times are changing for drivers around the world. Some day in the not-so-distant future, cars will be capable of driving themselves (we're working on it!). Until then, human drivers will play a critical role in keeping themselves and others safe on the road and squeezing as many miles as they can from each gallon of fuel.

That's why Ford provides tools, technology and training to help drivers perform their best.

[Ford Driving Skills for Life](#) (Ford DSFL), our free driver education program, is a centerpiece of our commitment to help new drivers improve their motoring skills. In North America and Europe, Ford DSFL programs help



**Megatrend: Resource and carbon constraints**

As both the developed and developing world continue to grow, innovation and ingenuity will be needed to overcome constraints in the availability of energy and raw materials.

> [Global Megatrends](#)

teenagers – the primary age group of first-time drivers in these regions – drive more safely. In many Asian, Middle Eastern and African markets, the number of people of all ages who are driving a car for the first time is increasing rapidly as more and more people are able to afford vehicles. In these markets, therefore, Ford DSFL is aimed at novice drivers of all ages. In total, Ford DSFL is training drivers to be safer in 23 countries around the globe and plans to grow to 30 before 2016.

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*Ford DSFL is training drivers to be safer in 23 countries around the globe.*

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We have also developed “eco-driving” tips that we offer through the Ford DSFL program and to the public through our website. These tips help drivers save money and fuel and cut emissions by driving more efficiently. Ford has demonstrated that drivers who practice eco-driving can improve their fuel economy by an average of 24 percent.

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*We plan to extend our Ford DSFL driver education program to 30 countries in total before 2016.*

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## Ford SYNC® system

Can your vehicle itself coach you to drive more efficiently? We think it can, with the right in-vehicle technologies. For example, Ford's SYNC® system offers real-time information on fuel-economy performance, while our navigation system offers an Eco-Route option that can give drivers the most fuel-efficient route to their destination. Ford testing shows that Eco-Route can help achieve fuel economy gains of up to 15 percent.

Until vehicles drive themselves, we will continue to help drivers be safer and more environmentally friendly – not just by providing them with better vehicles, but also by helping them be better drivers.

Also see:

> [Driver](#)

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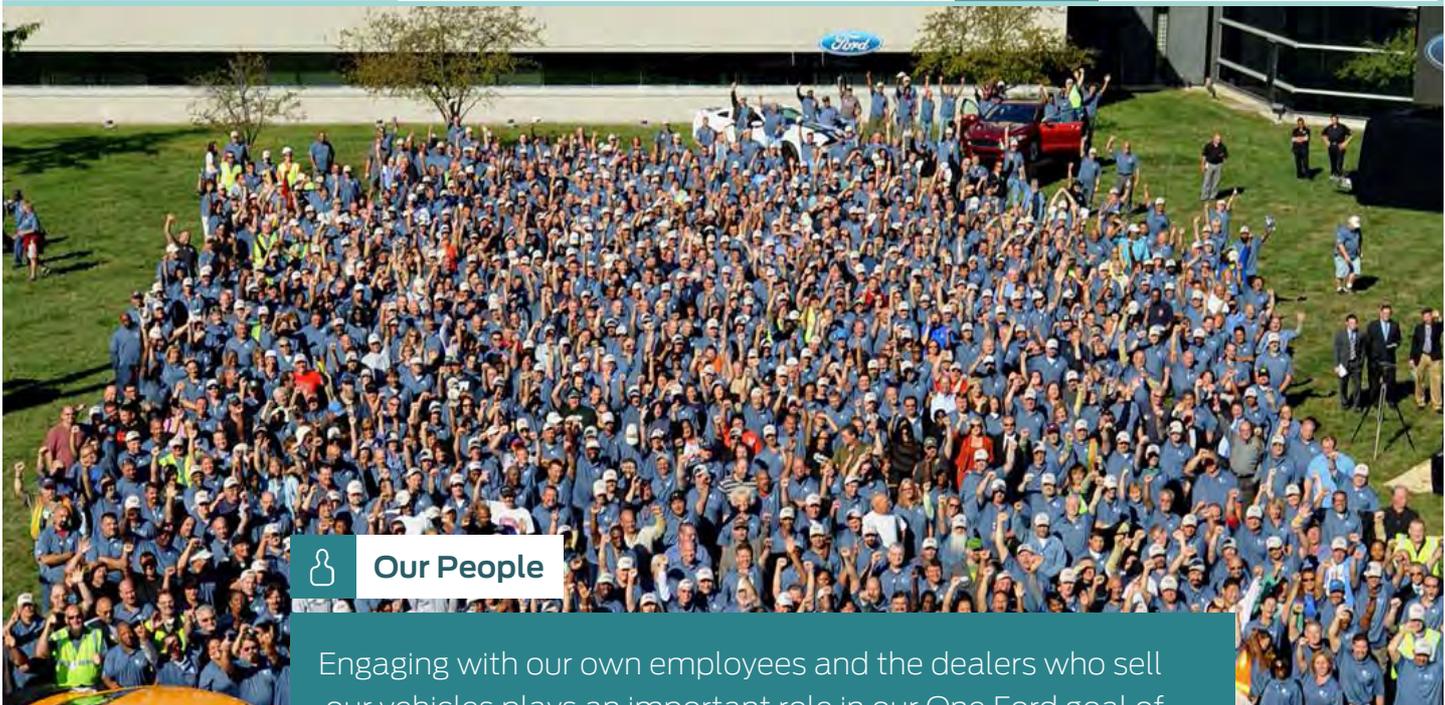
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*Ford's SYNC® system offers real-time information on fuel-economy performance and an “Eco-Route” navigation option.*

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### Our People

Engaging with our own employees and the dealers who sell our vehicles plays an important role in our One Ford goal of delivering profitable growth for all.

#### Our People

Working at Ford – Employees

Working with Ford – Dealers

Data

Voice: Ernie Gundling

Spotlight: Building a Globally Mobile Workforce



### Developing Diverse Talent

Ford relies ever more deeply on the skills and talents of our dedicated global workforce.

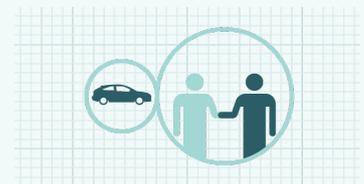
> [Diversity and Inclusion Awards](#)



### Safety at the Forefront

Our vision is to achieve zero fatalities and no serious injuries, and to protect and continually improve the health of our workforce.

> [Health and Safety](#)

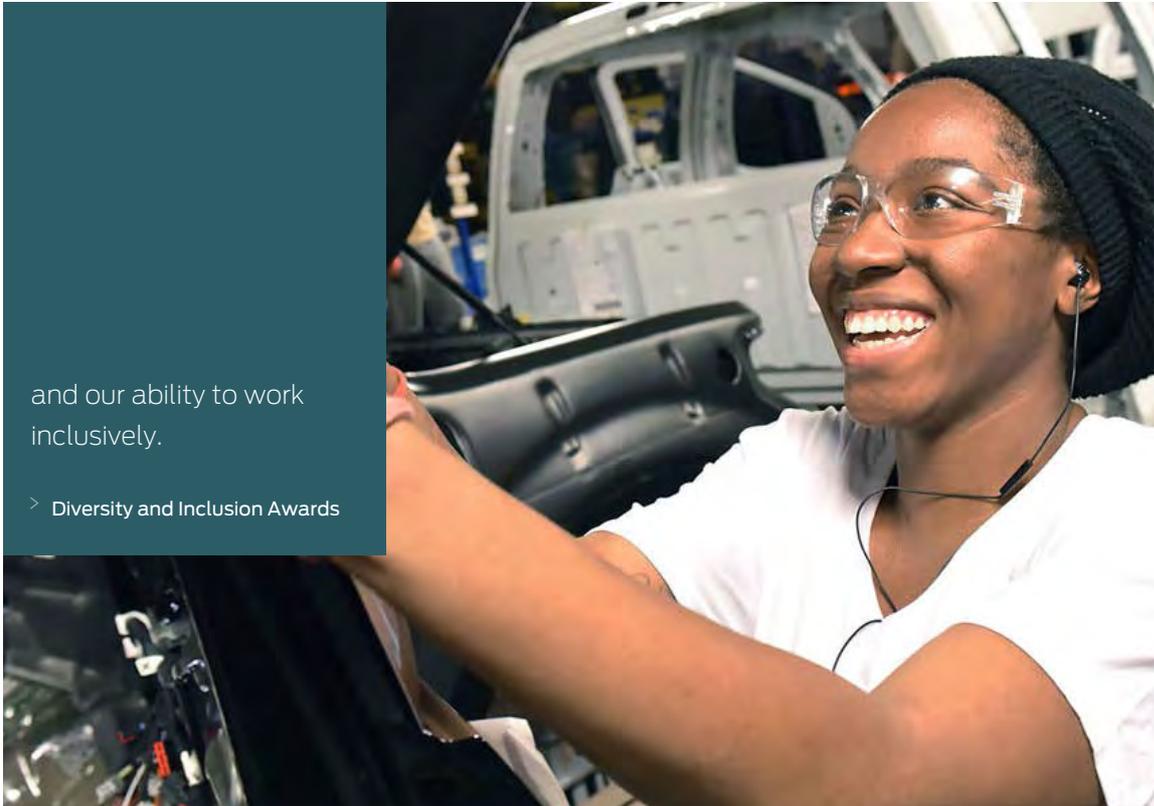


### Partnering with Our Dealers

Our dealers are a source of strength, important economic contributors to communities, and a critical part of our success.

> [Working with Ford – Dealers](#)

**DEVELOPING DIVERSE TALENT**  
We have received hundreds of awards in the last few years from publications and organizations that recognize the value we place on our employees



and our ability to work inclusively.

> [Diversity and Inclusion Awards](#)

**2014** marked the best overall safety track record in the company's history.

#### SAFETY AT THE FOREFRONT

Protecting our people through robust health and safety policies and practices is essential to our operations. A strong safety record is good for our employees and good for our business.

> [Health and Safety](#)

#### PARTNERING WITH OUR DEALERS

Our dealers represent the face of Ford to our customers and communities and provide employment, tax support, leadership and customer service.

> [Working with Ford – Dealers](#)



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- ▼ Diversity and Inclusion
- Employee Satisfaction
- ▼ Health and Safety

Working with Ford – Dealers

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# Working at Ford – Employees

Here at Ford, our employees are the drivers of our success. As we continue to witness surging global demand for our products, we rely ever more deeply on the skills and talents of our dedicated workforce of some 187,000 individuals who work in 62 facilities across six continents.

Ensuring a great place to work involves:

- Delivering a comprehensive [talent management](#) strategy
- Fostering a [diverse workforce](#) and an environment where people feel valued and included
- Understanding [employee satisfaction](#) and what employees value about being part of Ford Motor Company
- Providing a [healthy and safe](#) working environment

## Ford Employment Trends

As of December 31, 2014, Ford Motor Company employed approximately 187,000 individuals globally – 6,000 more than at the end of 2013.

In North America, large hiring initiatives have continued, with job growth often associated with exciting product launches and opportunities at our existing plants. For example:

*Large hiring initiatives have continued in North America.*

- To support production of the Lincoln MKC, 300 new jobs were announced at Ford’s Louisville Assembly Plant.
- Ford of Canada started hiring for more than 1,000 new jobs at the Oakville Assembly Plant, as this facility was selected to build the new global Ford Edge utility vehicle for export to more than 100 countries.
- Nearly 1,000 new hires began working at the Kansas City Assembly plant to support the launch of the all-new Ford Transit.

Whenever possible, we aim to share our successes with our employees. In the U.S. in 2014, for example, we paid record profit-sharing payments to about 50,000 eligible U.S. hourly employees.

At the same time, we experienced a contraction at our Genk Belgium plant at the end of 2014. This closure was planned and executed as the finishing step in Ford of Europe’s restructuring plans, which will help to manage reduced demand and thus reduced capacity requirements in the region.

## Employees Covered by Collective Bargaining Agreements

The vast majority of the hourly employees in our Automotive operations are represented by

unions and covered by collective bargaining agreements. In the U.S., approximately 99 percent of these unionized hourly employees are represented by the UAW.<sup>1</sup> Approximately 1.5 percent of our U.S. salaried employees are also represented by unions. Most hourly employees and many non-management salaried employees at our operations outside of the U.S. are also represented by unions.

These unions are key partners with Ford in providing a safe, productive and respectful workplace. For our hourly staff, Ford has been working collaboratively with our union partners to invest in our business and create jobs. Our work with unions allowed us to create 5,000 hourly jobs in 2014, which was a year ahead of schedule.

Our work with unions allowed us to create

**5,000**  
hourly jobs in 2014.

In addition, our continued investment in the business across the globe and in our hourly workforce has involved several new negotiated agreements. For more about our collective bargaining agreements, please see our [Form 10-K](#) (pdf, 6.5Mb).

## Global Employment Numbers

Number of employees

2009	2010	2011	2012	2013	2014
177,000	164,000	164,000	171,000	181,000	187,000

## Global Workforce 2014

Percent

	2013	2014
North America	46	48
South America	10	8
Europe	27	25
Asia Pacific	NA <sup>1</sup>	13
Middle East & Africa	13	2
Financial Services	3	4

1. In 2014, we reorganized our operations into five regional business units: Asia Pacific, Europe, North America, South America, and Middle East & Africa. Data for the Asia Pacific and Middle East & Africa business units (previously one Asia Pacific Africa business unit) have not been restated prior to 2014.

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## Our People

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    - Employee Satisfaction
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# Talent Management

Talent management begins with attracting and retaining talent and includes providing learning and development opportunities, engaging with employees effectively, using appropriate systems and technology, and conducting workforce planning using the latest analytical tools.

Our current manufacturing expansion is the fastest and strongest we have experienced in 50 years. To fuel this growth, we are hiring in North America and Asia Pacific – part of our largest hiring initiative in more than a decade. And in both of these regions, automakers must compete for talent. As such, we have stepped up our efforts to find the best and the brightest to join our team, to help to ensure Ford's success well into the future. And, we are tailoring our recruiting strategies to the needs and context of these two very different regions.

*Our fastest and strongest manufacturing expansion in 50 years.*

No matter the region, however, we strive to make Ford an employer of choice through competitive compensation and benefit programs, challenging and rewarding work, growth and career development programs, and the opportunity to be part of a leading company with a diverse workforce and great products.

## Recruiting and Onboarding in North America

In North America, we are putting a heavy emphasis on recruiting and networking via social media. In addition, we have launched employee profiles online so that candidates can learn more about roles. We've also enabled jobseekers to view information on careers at Ford on any device – smartphone, tablet or computer. As a result, Ford now has more mobile-enabled career information available than ever before.

### On this page:

- ↓ [Recruiting and Onboarding in North America](#)
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- ↓ [Worklife Flexibility Programs and Benefits](#)
- ↓ [Forecasting Our Talent Needs](#)

*We are providing more mobile-enabled career information than ever before.*



We are also making increased use of social media platforms such as Glassdoor, LinkedIn and Facebook. In 2014, we began posting jobs on Glassdoor, which allows potential candidates to both learn about the opportunities available and get candid, crowd-sourced input about the company from past and present employees. On LinkedIn and Facebook we are posting helpful hints for jobseekers, and we are providing connections to our hiring managers on LinkedIn to help showcase what it is like to work at Ford and give a “face” to opportunities at the company.

In 2014, we established a dedicated Ford Talent Center for salaried employees in Dearborn, Michigan. The Ford Talent Center allows us to provide better interview experiences for potential hires while showcasing our rich history, exciting products and location in southeast Michigan. It has given us the ability to conduct interviews using a more timely, nimble and streamlined process. Through the Ford Talent Center, we offer potential hires tours of the Rouge Factory, as well as a Dearborn campus tour that includes visits to the Dearborn test track, Product Development Center and Ford World Headquarters. We have received very positive feedback from candidates.

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*The Ford Talent Center is helping us provide better interview experiences for potential hires.*

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In the latter half of 2014 we invested in a new facility in Palo Alto, California, to further supplement our technical and geographic diversity as we focus on innovation and competition in mobility. This facility not only adds to Ford's geographic footprint, but it is focused on recruiting and hiring talent into our global research team, to help accelerate the company's innovation in connectivity, mobility, autonomous vehicles, customer experience and big data.

Also see:

[Ford's Research and Innovation Center in Palo Alto](#)

Also in 2014 in the U.S., Ford identified top universities with which we could partner and build strong relationships, in order to help us find and recruit top talent among students and recent graduates. In each case, we have worked to understand what the university and students are looking for so that we can target events, information and visits accordingly. In many cases, Ford executives visit campuses to share information about Ford, as well as to listen to the next generation of potential automotive leaders.

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*Ford partners with top universities in the U.S.*

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Finally, to help ensure that we attract qualified diverse job candidates, we partner with professional organizations in our recruiting efforts (such as participation in job fairs), including the following:

- National Association of Women MBAs
- National Black MBA Association, Inc.
- National Society of Black Engineers
- National Society of Hispanic MBAs
- Society of Hispanic Professional Engineers
- Society of Women Engineers
- US Chamber of Commerce (Hiring Our Heroes)
- Service Academy Career Conference

We know that once candidates are hired, it is important to provide them with a strong and positive onboarding experience that will improve retention. In early 2015, we launched a new onboarding program called Get Started that provides new employees with the tools and networks they need to be productive as soon as possible. As part of this program, new salaried employee hires at Ford now return to the Ford Talent Center to get an overview of the company and the resources available to them. Later in the year, new employees are invited to attend the Ford Corporate Orientation. The program includes presentations and Q&As with each primary skill team area, as well as meet-and-greets with Ford's senior leaders.

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*Our new onboarding program will help new employees to be productive as soon as possible.*

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## Recruiting in Asia Pacific

Ford's expansion in Asia Pacific is unprecedented. About five years ago, we saw the potential for huge growth in Asia and began an extraordinary ramp-up of new manufacturing facilities, especially in China, India and Thailand, to meet consumer demand for our vehicles. To build the pipeline of talented people necessary to run and manage these operations, we developed a comprehensive talent strategy for the region.

A key aspect of this strategy has been positioning Ford as an employer of choice in the region, by identifying and then sharing our value proposition with both potential and existing employees. We have conducted research to understand what is important to existing employees, conducted exit interviews to discover why people choose to leave, and made an effort to understand the perspectives and perceptions of new hires, both experienced and new to the workplace. Our ability to uncover insights, stories and perceptions of these stakeholder groups has allowed us to understand Ford's position in the Asian market – a society that is exceptionally well connected and where stories can travel fast through family, friends and social networks.

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*Ford's comprehensive talent strategy for Asia Pacific is aligned with our expansion in the region.*

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Our existing employees serve as ambassadors in the marketplace, sharing their experiences working with Ford and touting our collaborative and flexible work culture. Ford's success in Asian markets has also served as a differentiator in our employer branding efforts. With record profits and an expanding and popular product lineup, we have come to be seen as a desirable place to work.

All of these efforts have led to attraction and retention rates higher than the average in the region.

We have also built upon our existing talent management strategy in the Asia Pacific region in 2014, expanding it from campus recruitment to include experienced hires and the increased mobility of existing employees.

## Helping Build an Employee Pipeline for the Future

Continuous development of our employee pipeline is imperative. To help drive this

development, we invest significantly in STEM (science, technology, engineering and math) programs for schoolchildren. We hope these efforts will inspire an interest in technology and innovation, which is critical to Ford and the world's future development.

One initiative in particular is an example of Ford's commitment to strengthening our talent pipeline as well as transforming education for students of today and tomorrow. The "Powered by Ford" STEM Academies are designed to connect students and teachers with the real world, to better prepare them for life beyond high school. Students who attend these Academies learn rigorous, standards-based core academics through the lens of projects grounded in engineering, information technology, and manufacturing. In conjunction, educators in these Academies go beyond traditional methods of instruction to prepare students for the future – stepping outside of the classroom and into Ford Motor Company facilities to design projects based on current, real-world industry trends. Students in these Academies will be eligible to apply for the Ford Blue Oval STEM Scholarship (described below) and become members of the Ford Blue Oval Network – thereby building a strong relationship with Ford Motor Company.

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*Our STEM Academies connect students with the real world to better prepare them for life beyond high school.*

---

Ford has also significantly increased grants for high school teams in the FIRST® Robotics program. [FIRST Robotics](#) combines the excitement of sport with the rigors of science and technology. Under strict rules, limited resources and time limits, teams of 25 students or more are challenged to raise funds, design a team "brand," hone teamwork skills and build and program robots to perform prescribed tasks against a field of competitors. In 2014, we sponsored 50 FIRST high school robotics teams in the U.S. In addition, we funded grants for 45 elementary and middle school FIRST Robotics programs in Michigan.

Also in 2014, we launched a Ford Blue Oval STEM scholarship program. The program is open to high school seniors who have participated in select Ford STEM programs (such as the STEM Academies discussed above) and are pursuing a college degree in a STEM major. Fifty students from Ford-supported STEM programs were selected for these renewable scholarships in 2014.

## Worklife Flexibility Programs and Benefits

The challenges presented by a dynamic environment of intensifying global competition and changing employee needs and expectations present us with many strategic opportunities. Our inclusive worklife programs – including reduced and flexible schedules, job sharing and telecommuting options – enable us to meet business needs while providing strong employee engagement and satisfaction.

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*Reduced and flexible schedules, job sharing and telecommuting are some of the worklife options available to employees.*

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In addition, we use Digital Worker, an information technology program, to provide our employees with easy-to-use productivity and communication tools that increase employee capability to easily:

- Connect with others globally,
- Create, share and find information,
- Integrate with a mobile workforce, and
- Integrate personal and worklife priorities.

Also see:

> [Worklife Integration](#)

The benefits of our worklife programs include higher employee engagement and satisfaction, increased productivity, and the ability to attract and retain talented employees while meeting the needs of the company and all of our employees.

## Forecasting Our Talent Needs

Ford is building global capability in workforce planning and analytics. This is in direct alignment with our corporate strategy around big data and analytics, where we are recognized as an industry leader – including having received the INFORMS Prize in 2014 in this field.

Also see:

> [Workforce Planning and Analytics](#)

### READ MORE:

In this section:

- > [Learning and Development](#)
- > [Employee Engagement](#)
- > [Enabling Systems and Technology](#)
- > [Workforce Planning and Analytics](#)

> [Diversity and Inclusion](#)

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*We are using big data and analytics to plan our workforce needs for the future.*

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# Learning and Development

Employee development is crucial to delivering our vision of building great products that contribute to a better world.

## Creating a Skilled and Motivated Workforce

We know we must continue to create a skilled and motivated workforce and to expand the capabilities of our people – especially given that we are in a growth mode. We are thus investing in our employees, strengthening their technical and leadership skills and recognizing them for delivering results. Our vision is to be recognized for having world-class learning and development programs and unleashing the full potential of all our employees.

As a global company, we need standard processes for developing leaders around the world who can take Ford to the next level of performance. As with our vehicle development frameworks, we have been standardizing, simplifying and integrating our talent management processes globally, as well as implementing global competency frameworks and enhancing leadership development programs for experienced managers.

*We are standardizing, simplifying and integrating our talent management processes globally.*

Our global competency frameworks help salaried employees determine where they are in their development and map out individual plans to improve their capabilities. Individual Development Plans, or IDPs, enable employees to achieve future goals while maximizing performance in their current assignments. Using IDPs, employees work with their managers to identify strengths and areas for improvement and then create customized plans that go beyond traditional learning events for their individual developmental needs.

## Our Learning and Development Resources

Throughout our global operations we are working to create a learning culture, in which employees are able to continuously learn new things and adapt to change. We focus on “blended learning,” which is a combination of classroom learning, self-study, relationship building and hands-on experience. Our learning and development resources, which align with our One Ford principles, include virtual, Web-based and classroom training, experiential learning, special projects, task forces, mentoring and coaching, social networking, team “lunch and learn” events, other workshops and special projects that engage people in new ideas within the company. All of these resources seek to foster functional and technical excellence, encourage teamwork, promote Ford values and enhance our ability to deliver results.

## Leadership Development

In addition to functional and technical training, we have a strong portfolio of leadership development offerings. For example, we offer the Global Leadership Summit (GLS), which is aimed at executives and

*Development is for all employees. This is a key*

general managers; the Global Executive Leadership (GEL) Program, geared toward directors and senior managers; and the Experienced Leader Program (ELP), aimed at middle management. In 2014, we revamped the Salaried Supervisor Institute/Program (SSI) for new and experienced leaders and made incremental improvements to the GEL and GLS programs.

## Our leadership development portfolio



Salaried Supervisor  
Institute



Experienced Leader  
Program



Global Executive  
Leadership



Global Leadership  
Summit

## The content themes of our offerings are aligned to our ONE Ford behaviors

- Understanding self
- Developing others
- Supporting team effectiveness
- Building and leveraging relationships
- Operating in a global enterprise
- Creating a leadership environment

In growth markets such as Asia, we work to develop local leaders by providing 12 to 24 months of leadership development programs and tailor-made development plans for individuals.

One of our key principles is that development is for all employees. In our global manufacturing operations, we offer standardized Process Coach and Team Leader training to equip front-line production leadership with the competencies needed to successfully foster teamwork and achieve plant and business goals and objectives.

### READ MORE:

- [Spotlight: Building a Globally Mobile Workforce](#)
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# Employee Engagement

Keeping our employees engaged with the company and encouraging them to stay connected with their peers and communities are essential components of our people strategy here at Ford.

## Engagement, Creativity and Innovation

We know there is a strong benefit to the business when employees are engaged with their work and encouraged to be creative and innovative. A more engaged workforce helps us to attract and retain the talent we need to be an industry leader.

We believe it's important to communicate with our workforce in ways that are timely and transparent. We do so through a variety of interactive forums, from our company Intranet site, @Ford Online, to “town hall” meetings to executive chats, from joint labor-management committees to diversity councils. In recent years, we have also increased our use of social media applications, such as Facebook, to inform and connect with our employees. We are diversifying the methods we use to reach employees, recognizing that we need to utilize different platforms to connect with different employees based on factors such as competencies, experience and interests.

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*We use many different methods and platforms to connect with our employees.*

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This annual Sustainability Report, and the [high-level executive summary](#) (pdf, 806kb) we produce, are also designed to engage employees and inform them of our sustainability efforts. The summary is highlighted on our @Ford hub. Employees who are more engaged in sustainability can help us further advance our goals.

Our salaried employees are encouraged to “Go Further” the right way through a strong Code of Conduct and comprehensive Policy Letters and Directives covering topics that are relevant to their jobs.

Also see:

[> Ethical Business Practices](#)

## Communicating Proactively With Our Employees

For our hourly employees, we work closely with their unions to develop agreements and governance plans regarding changes in our operations (e.g., reorganizations, plant shutdowns, employee transfers and reductions). Joint labor-management committees are set up at each plant to give employees an opportunity to influence working conditions and practices.

We also practice regular two-way communication with all employees through webcasts; executive Q&A sessions between senior leadership and staff who wouldn't typically have face-to-face meetings with top-level management; quarterly “town hall” meetings, manager-to-

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*Twice annually we survey our salaried*

employee business cascades; surveys; online commenting; and informal communications. We survey our salaried employees twice annually using the Global Pulse and Engagement Surveys.

*employees to ask for  
their feedback and  
opinion.*

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## Our People: Customers and Ambassadors

Our employees are also our customers, and they can be strong ambassadors for our products. In Michigan, information sessions called @Ford Employee Events are held to give employees the opportunity to view, learn about and sometimes test drive our newest vehicles. This lets the employees see how our products are meeting the needs of customers, while providing factual information about the vehicles. Our employees can then promote the vehicles to their friends and families, which, in turn, can increase sales and help to strengthen the Ford brand.

Our Employee Resource Groups also conduct a number of events and initiatives each year to engage our employees, provide product insights and reach out to our communities.

Also see:

[> Diversity and Inclusion](#)

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# Enabling Systems and Technology

In the past, Ford HR teams have found it challenging to coordinate globally across multiple regions and IT systems. We are working to address this by developing a global, leading-edge HR technology platform – known as Genesis – for our entire salaried workforce of approximately 60,000 people across all Ford business units.

By building a global technology platform, we'll gain more insights into our workforce and how we can better meet the needs of our people and our business. We will be better able to support our people with online leading-edge processes, and enable better decision making to fully leverage our global talent base, as described in the Genesis Pyramid, shown below.



## Implementing Better Long-Range Workforce Planning

The new platform, which is being implemented in phases through 2016, will help us provide better long-range workforce planning for our business. It will allow us to manage employee data with standard sets of criteria across all of our global operations while respecting data privacy. In 2014, as part of the development and rollout, the system enabled the launch of standard competency frameworks across the globe, as part of our broader talent management strategy.

*We launched standard, global competency frameworks across Ford in 2014.*

The platform also includes a new employee development component, known as Career Navigator, which was rolled out on a pilot basis to 11,000 employees globally in 2013, and launched to all 60,000 salaried employees globally in 2014. Career Navigator is an

innovative tool that integrates all of our professional development processes in one place and enables quality, data-driven discussions between employees and supervisors. Other new technology components include global reporting, [workforce planning and analytics](#) and compensation planning.

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# Workforce Planning and Analytics

Ford is building global capability in workforce planning and analytics.

## Leading the Industry in Analytics

This is in direct alignment with Ford's corporate strategy around big data and analytics, for which we are recognized as an industry leader – including having received the [INFORMS Prize](#) in 2013 in this field. The INFORMS Prize is awarded for effective integration of advanced analytics and operations research/management sciences (OR/MS) in an organization. The award is given to an organization that has repeatedly applied the principles of advanced analytics and OR/MS in pioneering, varied, novel and lasting ways.

Data analysis is core to how Ford does business, makes decisions, investigates issues and solves problems. From a human capital perspective, we are applying these same analytic tools and processes to help us manage and work with our people. The intent is to leverage data on our workforce processes and systems and use it to draw insights that will illumine critical problems and appropriate solutions on everything from recruitment to retention to relocation.

Through Genesis, our new global technology platform, we are building three main areas of capability:

- Standard global reporting
- Human capital analytics (including forecasting and scenario planning)
- Strategic workforce planning

## Strategic Planning

Strategic Workforce Planning is of particular importance to Ford as we look into the future at our ambitious business and development plans globally. The process brings together Business Strategy, Operations and Human Resources to assess workforce readiness and develop robust talent management plans to help support delivery of the business plan.

As such, our efforts surrounding strategic workforce planning are centering on two main things:

1. Continuing the global deployment of technology tools tied to the Genesis global technology platform. This will give us better workforce reporting capability, help us complete analyses and draw insights across our skill teams and business units, and find areas to continuously improve.
2. Drive a culture of data analysis through our initiatives and growth of our new Workforce Planning and Analytics (WP&A) function.

*Genesis is our new global technology platform.*

*Robust talent management plans help support delivery of the business plan.*

We have multiple strategic pilots currently underway, one of which involves Ford's U.S. recruiting operations. The WP&A function in partnership with the Recruiting function is studying the recruiting process – looking at where we recruit, where people are joining from and the experience of the candidate – to understand what is working well; what could be more effective and efficient; and how we attract the best talent to Ford. Other global pilot projects involve conducting strategic workforce planning with select business units and skill teams.

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# Diversity and Inclusion

Diversity and inclusion remain key business strategies for Ford. We seek to embrace diversity and inclusion at every level of the company, from the boardroom to the design studio, from the plant floor to the engineering center.

## A Better, Stronger Company

Ford's senior executive leadership team endorses diversity and inclusion and takes pride in celebrating a workforce that reflects the society in which we live and work. Our diversity makes us a better company and a stronger company by bringing in fresh ideas, perspectives and experiences and by helping us to foster a truly collaborative workplace.

Ford is an equal opportunity employer. All qualified applicants receive consideration for employment without regard to race, religion, color, age, sex, national origin, sexual orientation, gender identity, disability status or protected veteran status. We are also committed to take affirmative action to attract and retain a diverse and inclusive workforce.

### READ MORE:

- [> Our Vision and Strategic Areas of Focus](#)
- [> Our Diversity Performance](#)
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# Our Vision and Strategic Areas of Focus

Our definition of diversity includes all those things that make each of us unique individuals. Our backgrounds, opinions, experiences, perspectives and life situations are just some of the distinctions we bring to the global workplace.

Our diversity and inclusion vision is to have a diverse and inclusive environment that fosters skilled and motivated people working together globally to drive business results in support of our One Ford strategic plan. This inclusive environment leverages diversity to create high-performing teams and organizations to drive business results. It also encourages Ford employees to:

- Maximize their professional and personal growth
- Recognize and respect the whole person
- Value the differences in employees' background, experience, knowledge and skills
- Maximize the benefits derived from a diverse workforce

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*We leverage diversity to create high-performing teams and organizations to drive results.*

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## Strategic Focus Areas

To achieve our vision, we have identified five strategic areas of focus:

- **Leading the way** – Our executive leadership team, led by our CEO, champions diversity and inclusion at Ford. To enable us to work together effectively across the global enterprise, the leadership team ensures that diverse perspectives are integrated into business objectives and key human resources processes.
- **Diverse Workforce** – Ford currently supports a number of employee networks, including thousands of employees in 11 Employee Resource Groups (ERGs) that help to foster diversity and inclusion. The ERGs, which started in the early 1990s, are organizations of employees who share similar interests, characteristics or life experiences, and desire to use those similarities to create cross-functional workplace connections, provide professional development and advance business imperatives. These include groups for employees of African ancestry; Hispanic, Asian Indian, Chinese and Middle Eastern employees; veteran and active military employees; employees dealing with disabilities; female professionals; working parents; gay, lesbian, bisexual and transgender employees; and the Ford Interfaith Network, which brings together separate affinity groups for Christians, Jews, Muslims, Hindus and other faiths. A number of the groups have chapters in our business units throughout the world. All of these ERGs have supported our company by helping the business to attract, develop and retain talent.

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*Thousands of Ford people participate in employee networks helping to foster diversity and inclusion*

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*Global Diversity & Inclusion Awards are held annually across Ford.*

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- **Respectful and Inclusive Work Environment** – Ford’s commitment to inclusion is incorporated into One Ford expected behaviors and communicated in ongoing forums such as Ford’s Intranet site and training. Every year since 1999, we’ve sponsored [Global Diversity & Inclusion Awards](#) to recognize individuals and teams who have exhibited the inclusive One Ford behaviors critical to our success as a company. Winners are recognized by their leaders and highlighted in our internal newsletters and social media sites in a year-long process. The participation of our employees from around the world in the award nomination process continues to grow. For 2014, our CEO and other senior executives honored 34 teams and individuals from Canada, South Africa, Brazil, China, Thailand, the Philippines, Germany, Russia, India, Mexico, Spain, Taiwan, Thailand, the U.K. and the U.S. Other employee resources include employee assistance programs, “mothers’ rooms” for nursing mothers in some of our global locations, meditation rooms and wellness initiatives.
- **Worklife Integration** – We encourage employees and managers to discuss both business and personal goals. Work/life flexibility creates a competitive advantage and addresses the needs of our global, multi-generational workforce. Ford Digital Worker is a global information technology program that supports One Ford and enhances employees’ ability to work remotely. Ford’s efforts to provide employees with tools such as WebEx, Instant Messenger and enhanced mobile access capability have increased employee productivity and satisfaction. Flexibility solutions, which vary depending upon location, team and employees, include options such as flex-time and “summer hours.”
- **External Partnerships** – In addition to supporting our employees, our Employee Resource Groups organize community volunteer activities and provide us with an opportunity to better understand the needs and wants of consumers of diverse backgrounds. Some of our ERGs’ recent initiatives include mentoring students from local schools; providing backpacks, uniforms and school supplies to underprivileged children; serving lunches to senior citizens; providing scholarships for inner city children; and raising funds to support children in Detroit and India.

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# Our Diversity Performance

We seek to incorporate our diversity and inclusion strategies into every part of our company, in order to leverage our innovative workforce, compete in the marketplace and serve the community.

## A Collaborative Effort

Diversity and inclusion is a collaborative effort across our entire enterprise. Some of our cross-functional collaboration includes working with Employee Resource Groups, Ford Fund & Community Services, Minority Dealer Operations, Recruiting, Supplier Diversity, and Worklife Flexibility & Benefits Programs.

In 2014, approximately 28 percent of our U.S. workforce (including both hourly and salaried employees) were members of minority groups and 23 percent were female. Among our global salaried workforce, 74 percent were male and 26 percent were female. Among managerial positions globally (defined as middle management and above), 18 percent were female. More information on our U.S. workforce by minority groups and gender can be found in the [GRI Content Index](#).

**18%**  
of managerial positions globally are held by women.

Of our 16-member board of directors, two are women and two are members of minority groups. Of our 42 corporate officers, six are women and eight identify themselves as minorities.

Serving a global customer base requires employees with different viewpoints, experiences and perspectives, all working together as members of a skilled and motivated team. The company will continue to examine, review and revise its diversity and inclusion efforts to ensure we are applying best practices to attract and retain the widest range of talent and experience available.

### READ MORE:

[Data: Employee Engagement and Diversity](#)

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# Diversity and Inclusion Awards

We have received hundreds of awards in the last few years from publications and organizations that recognize the value we place on our employees and our ability to work inclusively. Specific diversity awards given in 2014/15 include the following:

- 2015 Corporate Equality Index – *Human Rights Campaign*
- Employees' Choice for Best Places to Work 2015 – *Glassdoor*
- OEM Corporation of the Year – *Michigan Minority Supplier Diversity Council*
- Top 50 Most Innovative Companies 2014 – *Boston Consulting Group*
- Americans' Top 50 Organizations for Multicultural Business Opportunities 2014 – *Diversity Business*
- Best Companies for Diversity – *Black Enterprise*
- America's Ideal Employers – *Universum*
- Best Companies for Diversity – *Hispanic Business Magazine*
- Best of the Best – *Hispanic Network Magazine*
- Top 50 Employers for African Americans – *Black EOE Journal*
- Best Places to Work – *Human Rights Campaign*
- Top 100 Employers – *Latino Magazine*
- Top 50 Employers – *Equal Opportunity Magazine*
- Top 50 Employers – *Minority Engineer*
- Top 50 Employers – *Women Engineer Magazine*
- Top 50 Employers – *Workforce Diversity for IT & Engineering Professionals*
- 2015 100 Top Leaders – *Women's Enterprise USA*
- 2014 World's Most Attractive Employers – *Universum*

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# Employee Satisfaction

Each year, we ask our workforce to participate in the Global Pulse and Engagement Surveys to gain insight into employees' overall satisfaction with the company, their jobs and other aspects of their workplace experience.

## Driving and Improving Performance

We encourage our employees to provide candid feedback, and we benchmark results and participation externally. Results of the Pulse Survey are incorporated into our business planning review processes. Improving Pulse scores is an annual performance objective for many of our senior managers.

## Pulse Survey Results

In 2014, Ford continued to receive positive feedback from salaried and hourly/tariff employees who took part in the Global Pulse Survey. Seventy-seven percent of our salaried employees across the globe participated in the survey, which included a total of 55 multiple-choice questions across 12 dimensions of workplace life, including training and development, diversity and workplace safety practices, among others. All 12 of the dimensions showed improvement over the previous year. This result continues our recent track record (over the past five years) of steadily improving scores. Almost 52,000 hourly/tariff employees from 15 countries and more than 60 locations participated in the survey or a condensed version, showing improvement on all dimensions and a 3 percentage point improvement overall.

*All 12 of our Pulse Survey dimensions showed improvement over the previous year.*

This year's overall Employee Satisfaction score for salaried employees was the highest Ford has ever recorded. The Employee Satisfaction Index (ESI) section of the survey, which asks employees questions such as whether they feel valued at work and whether they believe they are rewarded for job performance, increased 1 percentage point from 2013, a statistically significant increase. Considered the bellwether of employee satisfaction, Ford's ESI score is 7 percentage points above the company's benchmark, which is composed of a group of Fortune 500 companies.

The most favorable responses for hourly/tariff employees were around company mindset, quality work practices and training. Seventy-nine percent of these employees said the company's values concerning quality have been communicated clearly to them, and 77 percent responded favorably that the people they work with cooperate to get the job done and that they receive the training needed to do a quality job. Improvement efforts will continue to focus on the effective implementation of our Ford Production System, which encompasses safety, quality, delivery, cost, people, maintenance and environment.

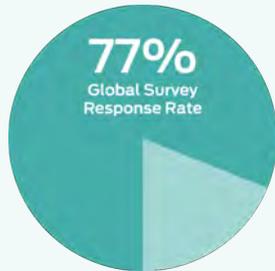
## Building on Pulse Survey Feedback

We believe that our steadily improving Pulse Survey results in recent years is due to managers and supervisors effectively taking lessons learned from the survey back to their

employees, and then working with their teams to make improvements. In fact, each year following the Employee Pulse Survey, we send managers and supervisors throughout Ford a report that shows how their teams and/or plants responded to the questions on the survey. The goal is for the managers and supervisors to then meet with their work groups, discuss the results and develop action plans for improvement.

See below for further detail on the Global Pulse Survey results.

## The Pulse is an important source of global feedback



2014 survey administered

From Aug 25 to Sept 26

In 23 languages

To salaried employees globally

2014 responses represent

47 countries

12 skill teams

6 business units

7,000 workgroups

## What are employees saying?

Overall, Ford employees are satisfied. Scores continue to improve year over year, indicating a positive working environment in general.



80% of respondents are satisfied with their job

84% of respondents are satisfied with their supervisor

80% of respondents are satisfied with The Company

## How do we compare?

Ford continues to exceed external scores on the Employee Satisfaction Index (ESI) and all questions that are benchmarked.

Satisfaction with information received about what's going on in the Company:

14

percentage points above benchmark

Received training needed to do a quality job:

10

percentage points above benchmark

Opportunity to improve skills in the Company:

10

percentage points above benchmark

Satisfaction with recognition received for doing a good job:

10

percentage points above benchmark

# Feedback and action planning

are key

87

The ESI score of employees who report receiving the results and planning actions

vs

31

The ESI score of employees who report neither receiving results nor planning actions

## Recognized Among the Best Places to Work

The satisfaction of our employees is not only evident through annual surveys. This year Ford Motor Company received the Glassdoor Employees' Choice Award for Best Places to Work for 2015, based on feedback from employees regarding their job, work environment and company. Ford is especially humbled by this award, as nominations rely solely on the input of employees who elect to provide feedback via Glassdoor's anonymous online survey. In the award program, Ford ranked 35 out of 50 Best Places to Work in the U.S. among employers with 1,000 or more employees and was the highest-rated automotive company. Worklife balance, competitive pay and benefits, and the opportunity for internal movement were cited among reasons to work for Ford.

### READ MORE:

As part of our efforts to increase satisfaction, we are constantly improving our strategies for fostering open dialogue with employees

> [Employee Engagement](#)

External websites:

To view the complete list of Glassdoor Best Places to Work for 2015, visit

↗ [Glassdoor](#)

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# Health and Safety

Protecting our people through robust health and safety policies and practices is essential to our operations. A strong safety record is good for our employees and good for our business.

At Ford, our safety vision is to achieve zero fatalities and no serious injuries, and to protect and continually improve the health of our workforce.

We want to demonstrate leadership in safety – compared not just to the manufacturing sector, but to all industries around the globe. We have made strong and steady progress. Since revamping our formal safety program in 1999, our overall injury rates have dropped by 90 percent, and 2014 was our safest year on record. But we're still not where we want to be, and we know we have more work to do.

Our overall injury rates have dropped by **90%** since 1999.

## Driving Safety Culture Improvements

Our top executives and managers remain committed to ensuring that our people stay safe and healthy while working as part of our One Ford team. We have adjusted management compensation to be more heavily weighted toward safety, to drive safety culture improvements. Our Board of Directors, for example, reviews our company's health and safety performance as part of CEO Mark Fields' annual assessment.

Safety is integrated into and core to all aspects of our business. Our Safety Operating System (SOS), which is part of our overall manufacturing strategy and provides for the health and safety of our employees. Safety is one of the core components of the Ford Production System, along with quality, delivery, cost, people, maintenance and environment.

## Broadening Our Focus to Risk Anticipation

In recent years we have been especially focused on changing the workforce culture within our plant operations to ingrain the importance of safety in all of our people, no matter their role. Most recently, this cultural change has broadened from injury and risk response to injury and risk anticipation. We're leveraging the One Ford philosophy of working together, caring for each other and creating a supportive environment in order to continue our positive culture shift.

We know that to manage health and safety effectively, we must maintain good relationships with all stakeholders. Globally, our unions share our commitment to a safe working environment and have been our partners at every step of our Health and Safety Leadership effort and other health and safety programs. We also maintain important external relationships with regulatory agencies, professional

*Globally, our unions share our commitment to a safe working environment and have been our partners at*

organizations and suppliers. In the U.S., formal partnerships among Ford, the UAW,<sup>1</sup> the U.S. Occupational Safety and Health Administration and its state counterparts are a visible example.

every step.

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Also see:

> [One Ford Behaviors](#)

## A Key Driver of Performance

The “health” part of health and safety remains a key driver of performance for Ford. We recognize the impact that health issues such as heart disease, diabetes, smoking and obesity can have on the well being of our employees. And in the U.S. and other markets, the cost of providing health care insurance to our employees is significant. By helping employees to prevent serious diseases and effectively manage chronic conditions, we can have a positive impact on our employees’ quality of life and our bottom line.

### READ MORE:

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*For more about our workplace safety systems, see the corresponding pages on:*

- > [Human Capital Management](#)
- > [Safety Culture and Accountability](#)
- > [Safe Working Environment](#)
- > [Health as a Strategic Advantage](#)
- > [Our 2014 Safety Record](#)

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1. UAW originally stood for United Auto Workers; the full name today is the International Union, United Automobile, Aerospace and Agricultural Implement Workers of America.

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# Safety Culture and Accountability

We have made substantial improvements in the safety performance of our operations over the last decade. In fact, in 2014 we had the best safety record in Ford’s history. We have improved our management systems, engineered out known safety risks wherever possible, and augmented our training. But getting to the next level – and our goal of zero fatalities and serious injuries – means we must change the culture of our leaders, our workforce and our contractors and vendors.

On this page:

- ↓ [Vendor and Contractor Safety Culture](#)
- ↓ [Changing Our Safety Culture](#)
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- ↓ [Safety Surveys](#)

In 2014 we marked the fourth-consecutive year of zero fatalities among Ford employees. However, there were four fatalities among contractors – in Kansas City, Brazil, Argentina and China – who were involved in construction projects at our facilities. As a result, we are continuing to emphasize changing the safety culture not only of our own employees, but also of the thousands of contractors and vendors we hire to clean our facilities, remove trash and scraps, cook meals in cafeterias and maintain equipment, among other outsourced tasks.

To continue to evolve as a leader in safety, our strategy has advanced past injury response toward injury anticipation. This involves partnering with employees, unions and contractors to identify and manage potential risk events. This also requires a significant shift in our data systems to focus on identifying and analyzing potential risks.

The data and systems now in development, which will be fully operational in 2016, will leverage the [Ford Production System](#) and focus on risk anticipation. For example, the systems will collect data on uncommon but potentially fatal events. By sharing the information with the affected stakeholders, we can develop action plans aimed at preventing these incidents. We are also looking at how to collect and share information about and with our contractors to address the potentially fatal contractor events that remain the biggest challenge for the automotive industry.

We believe this is the best path toward continued safety improvement and excellence. Reducing and eliminating all uncontrolled risks are characteristic of world-class operations, a standard that Ford aspires to reach.

## Vendor and Contractor Safety Culture

We are pleased that we have not had a fatality of a Ford employee for four consecutive years. Yet, we have continued to experience contractor fatalities and serious injuries on our property. Even though our contractor fatality rates are lower than the industry average, it is unacceptable to us that anyone would be killed or seriously injured while working at a Ford location.

The contractor fatalities in the U.S., Argentina, Brazil and China in 2014 occurred while individuals were doing routine activities related to their roles as construction contractors. Ultimately, safety is the responsibility of the contractors and vendors we hire to perform certain tasks on our behalf. While we at Ford cannot directly control these third parties' actions, we are working to encourage them to elevate the importance of safety and meet the highest safety standards. We want to be sure that the contractors and vendors we hire have the proper training and credentials and that they are making safety a top priority.

Our safety standards for contractors have been extended to all vendors, including the requirement that an individual be accountable for safety at the contractor or vendor organization. A Ford employee is also assigned as a dedicated safety liaison for each contractor at each location. We will continue to put an even greater focus on contractor and vendor safety in 2015.

## Changing Our Safety Culture

With our own employees, meanwhile, we continue to work to make safety a personal issue, and we believe it's been having an impact. Since 2010, when we produced a documentary about an employee who died in a tragic accident at Ford's Kentucky Truck Plant in Louisville, we have been producing more videos that tell real-life stories of employees who were injured – or who had a close call – on the job. Some of the “Faces of Safety” videos include images of a worker's family to remind our people that when they ignore the rules of safety on the job, they're not just putting themselves at risk – they're putting the futures of their loved ones at risk too.

Our target audience for the videos is skilled tradespeople – the employee category that is at highest risk for serious injuries. These are the individuals who troubleshoot equipment, make repairs and retool the manufacturing lines during a plant shutdown. Eight of our last 10 fatalities occurred during maintenance activities. Approximately 20 percent of our employees are in the skilled trades. Yet they have represented 80 percent of our fatalities.

As part of our cultural shift, we're also now working more closely with the UAW and use positive reinforcement to further encourage plant work teams toward safety successes.

## Reinforcing Accountability

We establish accountability for health and safety performance through business planning, policy deployment and scorecard processes, which set targets and assign responsibility for meeting those targets. Business operation and plant managers are responsible for health and safety in the operations they manage, and their performance in this area is a factor in their incentive compensation. In addition, safety performance is part of the scorecards of salaried employees as appropriate, including those of the CEO and business unit leaders.

As our safety programs have strengthened, we have looked for ways to increase the accountability of all workers so they not only follow the rules and procedures for themselves, but they also look out for their coworkers. Our safety data demonstrate to us that the majority of injuries are the result of individuals failing to follow established safety protocols. We have increased training programs to ensure that workers understand what is required of them and to further build accountability into individual safety performance.

We use multiple communication channels to reinforce safety messages, from our internal video broadcast system to messages from senior executives. In addition to regular safety talks, we periodically hold safety stand-downs that shut down production at our plants to focus attention on a safety message. We can communicate nearly instantaneously with health and safety specialists worldwide, alerting those at similar facilities when a significant accident occurs, so they can take appropriate preventive action.

## Safety Surveys

In 2014 we conducted, for the second time, safety surveys of manufacturing employees in all of our U.S. locations. Sponsored and supported by a joint UAW–Ford initiative, the 15-minute survey from the National Safety Council (NSC) asks employees 50 questions related to their perceptions of safety at our company. We first began the survey on a pilot basis in 2012 in four locations and then launched it to all locations in 2013. Approximately 60 percent of all manufacturing employees filled out the paper-and-pencil surveys.

Although our safety performance was outstanding in 2014 compared to prior years, the survey results showed that some of our people perceive we aren't doing enough to prevent injuries. To Ford, this indicates that we have an opportunity to improve, specifically around better engaging and communicating with our employees around our safety improvements and ongoing efforts to minimize risks. Out of this feedback, actions plans were formed and employee meetings regarding safety were held in all locations to begin to improve our communication efforts. A follow-up safety survey will be administered in 2015 to capture whether improved communication and engagement efforts have been effective.

We also address safety questions in the general employee Pulse survey. The results of this survey, combined with audits and routine gathering and sharing of performance data, provide a comprehensive picture of health and safety performance trends, as well as early warning of conditions that could lead to a decline in performance. The results of the 2014 Pulse survey show that the vast majority of Ford salaried and hourly employees give safety a positive rating.

**READ MORE:**

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> [Our 2014 Safety Record](#)

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# Safe Working Environment

Many factors contribute to safe working conditions, including the design and maintenance of the facility and its equipment, effective work processes and appropriate safeguards for potentially hazardous conditions. We use a variety of processes and programs to assess and manage risks. When potential hazards cannot be addressed through engineering, we use personal protective equipment and procedural controls to help prevent accidents and exposures.

We use internal and external benchmarking to drive health and safety improvements. Internal benchmarking helps us learn from plants that have demonstrated exemplary results and share the key leadership attributes that drive occupational health and safety excellence. Our annual President’s Health and Safety Award program is used to identify the global best practices for replication.

External benchmarking on injury performance and safety processes serves to challenge our facilities to achieve best-in-class performance and document effective injury performance and management processes. For example, we participate in a multi-industry group of companies that shares information and best practices on safety performance. Participants include several auto industry peers as well as companies in a broad range of industries, from health care to aerospace.

### Meeting with the Competition

The safety of our employees, contractors and visitors transcends the competitive spirit that exists at Ford, GM and Chrysler. In fact, the top safety leaders at each company routinely meet to discuss safety concerns, share ideas and develop methods to ensure people working in or visiting our facilities remain safe.

Ford has made consistent progress in safety performance over the years. In benchmarking against our competitors, Ford now holds a strong position in the top quartile. In the next year or two, we anticipate that our performance will improve to be first or second in the industry by maintaining our focus on increased standards, fostering our safety culture and risk and injury anticipation.

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# Health as a Strategic Advantage

The continued good health of our workforce and their families remains a priority for the company. Our approach to employee health and, in particular, U.S. health care, is rooted in our core business and our Employment Value Proposition. We are committed to the ongoing evaluation and improvement of programs that promote the good health, well-being, longevity and productivity of our workforce.

Our health vision is to foster knowledgeable, motivated people who stay well and receive appropriate, efficient health care services.

Since families tend to share health habits – good and bad – promoting health among our employees contributes to healthier communities. Through our U.S. and global health initiatives, we are confident we will be successful in improving the health of our workforce and managing our health care cost obligations in an efficient manner.

## United States

In the U.S., health care availability and affordability continue to be of concern. To mitigate our health-care-related costs, maximize worker productivity and improve the overall health of our communities, we are committed to health and wellness programs that help our employees and their families become healthier and maintain good health. We provide resources and tools to help employees make sound choices about health care services and coverage and become better health care consumers.

Salaried workers in the U.S. who participate in a health risk appraisal and meet with their primary care physicians to better understand their health status are rewarded with lower insurance deductibles. In 2014, more than 80 percent of salaried employees and retirees met the objectives of this program and increased their awareness of personal health improvement opportunities.

For our hourly workforce, we are partnering with the UAW and Southeast Michigan health care providers to pilot a two-year program called the Enhanced Care Program. The goal of the program is to provide care that treats overall health and leads to a better quality of life. Through a personalized care approach, the program looks for ways to help with current chronic, manageable health care needs (including asthma, diabetes, coronary artery disease, congestive heart failure and chronic obstructive pulmonary disease) and to prevent future problems when possible. The pilot is expected to help us deliver better health care to our employees while helping to lower total health care costs.

Participating patients have access to a personal health care nurse who works closely with a patient and his or her doctor to coordinate care and achieve the patient’s personalized health goals. Patients can contact their personal care nurses by phone, email or in person – as frequently as needed and at no additional cost. More than 1,200 UAW members and

non-Medicare retired members joined the voluntary pilot.

We are also collaborating with other large payers, health plans and government agencies by:

- Participating in regional health care quality measurement and public reporting initiatives, with potential data sharing and funding assistance from the government
- Promoting the development of health care initiatives that aim to improve or change the dynamic of the health care marketplace
- Developing new programs to improve the health of employees and family members who are affected by chronic diseases

## Global

Globally, we remain committed to the One Ford health care strategy. Our goal is to build a culture of wellness that lets people perform at the top of their game at work, at home and into retirement. Our efforts are tailored to meet local health priorities and to ensure that our people receive quality health care when they need it. We focus on health screenings, educational programs and promotional campaigns. We use global health metrics (such as percentage of population at low, medium and high risk for disease) to assess the health of our workforce and track the results of our programs.

Our Latin American operations have taken strong leadership in promoting the health of the workforce with a unique approach. In 2013, Latin America launched their health promotion efforts by defining four health pillars:

- Movement
- Good nutrition
- Disease prevention
- Substance-free living

Each country (Mexico, Argentina, Brazil and Venezuela) has developed different initiatives aligned with these pillars based on local conditions and concerns. Some standard initiatives have also been implemented across the region, including designating all facilities, buildings and plants as smoke-free. This was achieved through collaboration and engagement with both salaried and hourly employees and our Latin American union partners.

The reach of these initiatives goes beyond our employees to the families and communities of our employees. For example, nutrition initiatives are targeted at the entire household, as involvement of the entire family is needed to support success. In addition, we reach out to the community to involve them in disease-prevention efforts.

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# Our 2014 Safety Record

The year 2014 marked the fourth year in which we did not have an employee work-related fatality, and we experienced our best overall safety track record in the company’s history. Tragically, however, we did experience four fatalities of contractors – in Kansas City, Argentina, Brazil and China. Overall, our safety record improved compared to 2013. A major safety indicator – the lost-time case rate – was at 0.38, a 14 percent improvement from the 2013 rate of 0.44.

## Ford Lost-time Case Rate 2000–2014

Cases per 200,000 hours worked

	Ford Global Rate	U.S Motor Vehicle Manufacturing (NAICS 3361/SIC 3711)
2014	0.38	NA
2013	0.44	1.4
2012	0.51	1.5
2011	0.57	1.6
2010	0.54	1.4
2009	0.61	1.3
2008	0.71	1.3
2007	0.86	1.5
2006	1.09	1.8
2005	1.52	2.2
2004	1.31	1.9
2003	1.83	2.2
2002	2.06	2.1
2001	2.55	2.7
2000	4.05	3.6

Our primary objective remains zero fatalities on Ford property. While we are pleased that we did not have a fatality among any of our own employees, we will remain vigilant to eliminate all fatalities, including among employees and contractors. Our contractor fatality rate is far

*Our primary objective remains zero fatalities on Ford property.*

below the industry average, but true success comes in the form of zero fatalities.

In 2014, we had 426 high-potential reported events that could have resulted in more serious consequences, but did not. Each of the incidents was investigated, resulting in the implementation of many preventive measures globally. While this number may seem high, we see it as a sign of higher organizational awareness of potential risks and a willingness to share information with others so the same events do not happen elsewhere.

In line with our focus on risk anticipation, we will continue to encourage identification and collection of these preventable events in our data systems.

We are encouraging all employees to alert management to every injury or hazard, no matter how small, so that we can learn from every mistake, take corrective actions and create a safer workplace for everyone. We continue working in a collaborative way with the UAW to change the culture so that individuals are motivated to take greater responsibility and ownership for addressing any safety risks and unsafe behaviors.

Through 2016, we will continue upgrading our information technology to create a common global system for tracking workplace injuries, incidents and causal factors, with a focus on risk anticipation over simply risk response. Having a common system to record incidents will allow us to conduct much more detailed analyses of each event and, as a result, improve overall performance.

#### Ford's Lifesavers

Ford's ability to achieve zero fatalities and reduce injuries among our employees depends on the leadership our own employees take with their colleagues. In 2014, Ford issued a record number of "Lifesaver" awards to our employees across the globe. A Lifesaver is an employee who has not only adhered to our safety policies and processes, but also truly embodied the culture of safety by intervening with other employees to prevent injuries and fatalities.

In 2014 alone, 24 lives were saved as a direct result of employee actions. Examples of interventions that have led to us recognizing Lifesavers include the following:

- Two employees from the Sanand Vehicle Assembly and Engine Plant responded to two coworkers who were in a motorcycle accident on the way to work. They rendered emergency first aid and transported the injured employees to the nearest hospital so that they could receive lifesaving treatment.
- The plant safety engineer at the Ford Thailand Manufacturing Plant performed the Heimlich maneuver on a choking victim in the cafeteria, saving his life.
- The emergency response team at Woodhaven Stamping plant performed CPR and used an automated external defibrillator (AED) to revive their co-worker, who was not breathing and had no pulse when they found him.
- The medical staff at the Dagenham Engine Plant responded to two employees with life-threatening traumatic injuries, stabilizing them until they could be airlifted for medical treatment.
- The emergency response team from the Dearborn Truck Plant used an AED to revive an unresponsive employee who had suffered a cardiac arrest, saving his life.
- A Ford Credit employee donated a kidney to the husband of a co-worker who was suffering from kidney failure and in need of transplant.



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Voice: Ernie Gundling

Spotlight: Building a Globally Mobile Workforce

# Working with Ford – Dealers

Our dealers are a source of strength. They are a critical part of our success and important economic contributors to their communities. They represent the face of Ford to our customers and communities and provide employment, tax support, leadership and customer service.

On this page:

- ↓ Dealer Network
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## Dealer Network

As of year-end 2014, our 3,247 Ford and Lincoln dealers in the U.S. employed 170,000 individuals, with an annual payroll in excess of \$7 billion. Worldwide, we had 11,980 Ford and Lincoln dealerships as of year-end 2014.

As part of our efforts to improve the Ford retail customer experience and to create loyal advocates of our products and services, we continue to work collaboratively with our U.S. Ford dealers to improve dealership facilities through the Ford Trustmark Facility Assistance Program. In addition, we continue to work with our Lincoln dealers to focus our mutual efforts on the transformational change necessary to meet the high expectations of the luxury customer, including upgrading dealership facilities and the services provided at those dealerships.

On average, U.S. Ford dealers were more profitable last year than in 2013, driven by increased used vehicle parts, service, and body shop sales. U.S. Lincoln dealers were also more profitable on average than in 2013, as higher demand for our new and freshened models increased new vehicle sales.

*On average, U.S. Ford dealers were more profitable last year than in 2013.*

## Engaging with Dealers

Dealer relations are a key priority for us. The Ford and Lincoln Dealer Councils provide forums for open dialogue between Dealer Council members and Ford. Through the Council process, dealers can voice their concerns, needs and ideas for working more productively as a team. Also, dealers annually identify their priorities, which are published along with Ford management responses, providing transparency into the discussions between the company and its dealers.

To ensure that communication lines remain open, Dealer Council members also participate as members of Ford's National Dealer Advisory Panels. The current Dealer Advisory Panels, and the topics they address, are as follows:

- **Commercial Truck Advisory Board (CTAB)** – sales, marketing and product programs
- **Consumer Experience Movement Committee (CEM)** – key customer experience initiatives, including potential opportunities and risks and next steps
- **Customer Viewpoint Advisory Panel (CVP)** – customer satisfaction rating system,

Viewpoint survey

- **Dealer Product Advisory Committee (DPAC)** – current and future product cycle plan, including lineup, design, styling and color/trim options
- **Fixed Operations Strategic Advisory Board (FOSAB)** – fixed operations long-term business growth opportunities
- **Ford Credit Dealer Advisory Board** – vehicle financing and competitiveness
- **FordDirect Dealer Advisory Board** – new digital consumer lead products and services
- **Government Affairs Committee** – advice to Ford Motor Company's Government Affairs office on federal and state automotive legislative issues that have major implications for the business and industry
- **Marketing Dealer Advisory Board (MDAB)** – vehicle packaging strategy, advertising creative, incentive programs for Ford
- **Parts and Service Manager Advisory Committee (PSMAC)** – fixed operations programs, including employee recognition and retention
- **Retail Experience of the Future (REOF)** – online vehicle search engines and third-party aggregators (e.g., Google, Cars.com, TrueCar) of Web-based vehicle searches and sales leads
- **Training Advisory Board (TAB)** – dealership employee training and recognition

The feedback gathered through these interactions has helped us develop programs, change policies and enhance processes to improve the customer ownership experience and other significant elements of dealers' businesses.

In addition to the feedback provided through the Dealer Council and Dealer Advisory Panels, dealer satisfaction is measured in various ways, including the biannual survey of the National Automobile Dealers Association (NADA) as well as day-to-day interaction with our dealers. Approximately 54 percent of Ford dealers and 52 percent of Lincoln dealers provided feedback through the summer 2014 NADA survey process. We remained consistent in many areas of this survey compared with our winter 2013 record improvements, including in our Regional Sales, Service and Parts Personnel rankings. In addition, Ford Motor Credit Company Capability rankings exceeded the industry and previous scores in nearly every category. Finally, Value of Franchise, Product Quality, Competitiveness, Policies and Procedures, and Vehicle Incentives also showed favorable results.

Also see:

[National Automobile Dealers Association \(NADA\)](#)

## Dealer Diversity

Diversity and inclusiveness are core to Ford's DNA. Growing a strong minority presence in our dealerships remains a key focus. At year-end 2014, Ford had 158 minority-owned dealerships, representing 4.9 percent of our 3,247 U.S. Ford and Lincoln dealerships.

At Ford, we have taken steps to better understand the diversity of our markets. We strengthened our efforts to develop both our dealers and our prospective dealers through financial assistance, training and education. And we continue to work with our Ford Minority Dealers Association (Ford

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**4.9%**  
of our Ford and Lincoln  
dealerships in the U.S. are  
minority-owned.

MDA) to sustain and strengthen viability while working to gain new partners at all levels of the dealership body.

**READ MORE:**

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*Ford and Lincoln dealers play an important part in Ford's community engagement and investments.*

> [Dealers in Our Communities](#)

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Employee Engagement and Diversity

Workplace Safety

Voice: Ernie Gundling

Spotlight: Building a Globally Mobile Workforce

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## Employee Engagement and Diversity

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- > Overall Dealer Attitude
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- > U.S. Employment of Minority-group Personnel and Women at Year-end
- > Global Salaried Employees by Gender
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- > Voluntary Quit Rate by Major Markets (Salaried Employees)
- > Women in Middle Management and Above Positions by Region
- > Corporate Officers by Gender and Minorities
- > Board of Directors Composition by Gender and Minorities

## Workplace Safety

- > Global Lost-time Case Rate (per 100 Employees)
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- > Workplace Health and Safety Violations
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## Our People

Working at Ford – Employees

Working with Ford – Dealers

### Data

**Employee Engagement and Diversity**

Workplace Safety

Voice: Ernie Gundling

Spotlight: Building a Globally Mobile Workforce

# Data: Employee Engagement and Diversity

Data on this page:

- A. [Employee Satisfaction, Pulse Survey](#)
- B. [Overall Dealer Attitude](#)
- C. [Employment by Business Unit](#)
- D. [U.S. Employment of Minority-group Personnel and Women at Year-end](#)
- E. [Global Salaried Employees by Gender](#)
- F. [Global Workforce by Region](#)
- G. [Voluntary Quit Rate by Major Markets \(Salaried Employees\)](#)
- H. [Women in Middle Management and Above Positions by Region](#)
- I. [Corporate Officers by Gender and Minorities](#)
- J. [Board of Directors Composition by Gender and Minorities](#)

## A. Employee Satisfaction, Pulse Survey

	Percent satisfied					
	2009	2010	2011	2012	2013	2014
Employee Satisfaction Index	68	68	69	71	75	<b>76</b>
Company Success Mindset	85	84	84	86	87	<b>88</b>
Management Commitment to Diversity	81	82	82	86	87	<b>88</b>
Overcoming Workplace Obstacles	64	62	63	66	68	<b>70</b>

Data notes and analysis:

Each year, we ask our workforce to participate in the Global Pulse and Engagement Surveys to gain insight into employees' overall satisfaction with the company, their jobs and other aspects of their workplace experience. 2014's overall Employee Satisfaction score for salaried employees was the highest Ford has ever recorded.

Also see:

[Employee Satisfaction](#)

## B. Overall Dealer Attitude

Relative ranking on a scale of 1–100 percent

	2009	2010	2011	2012	2013	2014
Ford (winter/summer score)	71/80	83/85	84/82	84/83	84/85	85/85
Lincoln <sup>1</sup> (winter/summer score)	66/71	71/62	61/64	68/67	76/78	77/77
Industry (winter/summer score)	70/74	75/78	80/81	81/81	81/81	80/80

Data notes and analysis:

1. Ford stopped production of Mercury with the 2011 model year. Beginning in 2011, the dealer satisfaction data for Lincoln dealers no longer include Mercury dealers.

Overall dealer attitude is measured by the National Automobile Dealer Association (NADA) Dealer Attitude Survey conducted biannually.

Approximately 54 percent of Ford dealers and 52 percent of Lincoln dealers provided feedback through the summer 2014 NADA survey process. We remained consistent in many areas of this survey compared with our winter 2013 record improvements, including in our Regional Sales, Service and Parts Personnel rankings. In addition, Ford Motor Credit Company Capability rankings exceeded the industry and previous scores in nearly every category. Finally, Value of Franchise, Product Quality, Competitiveness, Policies and Procedures, and Vehicle Incentives also showed favorable results.

Also see:

> [Working with Ford – Dealers](#)

## C. Employment by Business Unit

Average number of people employed

	2009	2010	2011	2012	2013	2014
Automotive	169,000	157,000	157,000	165,000	175,000	181,000
Financial Services	8,000	7,000	7,000	6,000	6,000	6,000
<b>Total</b>	177,000	164,000	164,000	171,000	181,000	187,000

 Reported to regulatory authorities

Data notes and analysis:

All figures as of year-end. Historical employment figures from some years have been rounded and/or restated to align with financial reporting documents.

Also see:

> [Working at Ford – Employees](#)

## D. U.S. Employment of Minority-group Personnel and Women at Year-end

Percent

	2009	2010	2011	2012	2013	2014
Minority-group personnel – total	24	24	24	26	27	28

Minority-group personnel – salaried	23	22	22	23	24	<b>23</b>
Minority-group personnel – hourly	24	25	25	28	29	<b>31</b>
Women – total	23	22	22	22	22	<b>23</b>
Women – salaried	31	29	28	28	27	<b>27</b>
Women – hourly	17	18	18	19	20	<b>20</b>

 Reported to regulatory authorities

Also see:

[> Diversity and Inclusion](#)

## E. Global Salaried Employees by Gender

	Percent	
	2013	<b>2014</b>
Male	74.3	<b>74</b>
Female	25.7	<b>26</b>

Data notes and analysis:

For 2013, Ford began publicly reporting global salaried employees by gender.

Also see:

[> Working at Ford – Employees](#)

## F. Global Workforce by Region

	Percent	
	2013 <sup>2</sup>	2014 <sup>1</sup>
North America	46	<b>48</b>
South America	10	<b>8</b>
Europe	27	<b>25</b>
Asia Pacific	NA	<b>13</b>
Middle East & Africa	13	<b>2</b>
Financial Services	3	<b>4</b>

 Reported to regulatory authorities

Data notes and analysis:

1. In 2014, we reorganized our operations into five regional business units: Asia Pacific, Europe, North America, South America, and Middle East & Africa. Data for the Asia Pacific and Middle East & Africa business units (previously one Asia Pacific Africa business unit) have not been restated prior to 2014.
2. 2013 numbers do not add up to 100 due to rounding.

Also see:

> [Working at Ford – Employees](#)

## G. Voluntary Quit Rate by Major Markets (Salaried Employees)

	Percent	
	2013	2014
United States	1.4	1.5
Canada	1.2	2.5
Mexico	2.7	1.1
Brazil	2.4	2.7
Germany	0.5	0.4
United Kingdom	1.1	1.1
China	4.2	3.8
India	4.7	5.8
Thailand	9.5	6.7

Data notes and analysis:

For 2013, Ford began publicly reporting voluntary quit rate by major markets.

Also see:

> [Working at Ford – Employees](#)

## H. Women in Middle Management and Above Positions by Region

	Percent	
	2013	2014
Americas	19.1	19.9
Asia Pacific Africa	16.7	17.5
Ford Credit	21.5	20.5
Europe	10.8	11.6
Global	17.0	17.7

Data notes and analysis:

In 2013, Ford began publicly reporting women in middle management positions by region.

Also see:

[> Diversity and Inclusion](#)

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## I. Corporate Officers by Gender and Minorities

	Percent	
	2013	2014
Male	90.5	85.7
Female	9.5	14.3
Minorities	19.0	19.0

Data notes and analysis:

For 2013, Ford began publicly reporting corporate officers by gender and minorities.

Also see:

[> Diversity and Inclusion](#)

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## J. Board of Directors Composition by Gender and Minorities

	Percent	
	2013	2014
Male	88.2	87.5
Female	11.8	12.5
Minorities	11.8	12.5

Data notes and analysis:

For 2013, Ford began publicly reporting Board of Directors composition by gender and minorities.

Also see:

[> Diversity and Inclusion](#)

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Working with Ford – Dealers

### Data

Employee Engagement and Diversity

#### > Workplace Safety

Voice: Ernie Gundling

Spotlight: Building a Globally Mobile Workforce

# Data: Workplace Safety

Data on this page:

- A. [Global Lost-time Case Rate \(per 100 Employees\)](#)
- B. [Lost-time Case Rate by Region \(per 100 Employees\)](#)
- C. [Workplace Health and Safety Violations](#)
- D. [Global Fatalities](#)

## A. Global Lost-time Case Rate (per 100 Employees)

Cases with one or more days away from work per 200,000 hours

	2009	2010	2011	2012	2013	2014
Ford Motor Company (global)	0.61	0.54	0.57	0.51	0.44	0.38
U.S. Bureau of Labor Statistics average for NAICS Code 3361 (motor vehicles manufacturing)	1.3	1.4	1.6	1.5	1.4	NA

Data notes and analysis:

NA = Not available.

Also see:

> [Health and Safety](#)

## B. Lost-time Case Rate by Region (per 100 Employees)

Cases with one or more days away from work per 200,000 hours

	2009	2010	2011	2012	2013	2014
North America	NA	NA	NA	NA	NA	0.75
South America	NA	NA	NA	NA	NA	0.23
Middle East & Africa	NA	NA	NA	NA	NA	0.04
Asia Pacific	NA	NA	NA	NA	NA	0.03
Europe	0.5	0.3	0.3	0.4	0.3	0.33
Americas	0.9	0.8	0.9	0.8	0.7	NA
Asia Pacific Africa	0.2	0.1	0.1	0.1	0.1	NA

Data notes and analysis:

NA = Not available.

For 2009 to 2013 lost time case rate by region data is reported for three regions: The Americas (which includes our operations in North and South America), Europe and Asia Pacific Africa (which includes our operations in Asia Pacific and Africa). In 2014, we reorganized our operations into five regional business units: Asia Pacific, Europe, North America, South America, and Middle East & Africa. For 2014 and future years, we will report lost time case rate by region according to our new regional structure.

Also see:

[> Health and Safety](#)

## C. Workplace Health and Safety Violations

Number of violations

	2009	2010	2011	2012	2013	2014
North America	NA	NA	NA	NA	NA	4
South America	NA	NA	NA	NA	NA	1
Middle East & Africa	NA	NA	NA	NA	NA	0
Asia Pacific	NA	NA	NA	NA	NA	0
Europe	0	0	0	0	0	0
Americas	0	1	3	2	2	NA
Asia Pacific Africa	0	0	0	1	5	NA
<b>Total</b>	0	1	3	3	7	5

Data notes and analysis:

NA = Not available.

From 2009 to 2013 workplace health and safety violations data is reported for three regions: The Americas (which includes our operations in North and South America), Europe and Asia Pacific Africa (which includes our operations in Asia Pacific and Africa). In 2014, we reorganized our operations into five regional business units: Asia Pacific, Europe, North America, South America, and Middle East & Africa. For 2014 and future years, we will report workplace health and safety violations according to our new regional structure.

Also see:

[> Health and Safety](#)

## D. Global Fatalities

Number of fatalities

2009	2010	2011	2012	2013	2014
4	3	2	1	3	4

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*Data notes and analysis:*

Global fatalities data include Ford employees and contractors. In 2014, we marked the fourth consecutive year of zero fatalities among Ford employees. However, there were four fatalities among contractors – in Kansas City (Missouri), Brazil, Argentina and China – who were involved in construction projects at our facilities.

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Also see:

> [Health and Safety](#)

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## Our People

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**Voice: Ernie Gundling**

Spotlight: Building a Globally Mobile Workforce

## Voice: Ernie Gundling

Ernie Gundling talks about his work with Ford in Asia focusing on talent attraction, retention and development.

“ Our connection with Ford dates back to the late 1990s. Even then, our first engagement had a global theme – a video series on doing business in Asian countries. Now, nearly 20 years later, we are still working with Ford in Asia – only this time with a focus on talent attraction, retention and accelerated leadership development.

Asia Pacific has emerged as the world’s largest automotive market in terms of the number of vehicles sold. In response, Ford is making a huge commitment to China and India especially, investing billions of dollars in factories and equipment. But such rapid investment has created a tremendous need for people. For Ford, the concerns are really twofold: First, attracting and hiring people into the company; and then developing and retaining them for the long term.

All global companies, to some extent, are confronting similar human capital challenges. Ninety percent of the world’s children under the age of 15 currently live in developing countries. This has enormous implications for the future labor market as well as for the future supply chain and customer base. Historically, a company like Ford might have taken 20 years to build a talent pool in a particular location. Today, there’s a much smaller window of time in which to accomplish that. The workforce needs are here and now, especially in Asia but also in markets such as the Middle East and Africa.

It is particularly important that Ford develop talent locally within its new markets in Asia and other locations, rather than solely bringing in leaders from more developed markets such as the U.S. and Europe. Assignments for expatriate employees are expensive, costing companies millions of dollars in relocation and related expenses. If a company doesn’t have the local talent available, such relocation is obviously necessary. But beyond just cost, there are other important reasons for developing talent in Ford’s newest countries of operation. After all, who is better equipped to understand the needs of the local consumers than those who grew up in those markets, speak the local language, and know first-hand the work and lifestyles of people in their communities?

It is certainly possible to have strong and effective leadership from someone who comes to one country from another, and Ford has many fine examples of this. Expatriates also learn



**Ernie Gundling**

Managing Partner and Co-Founder, Aperian Global

Aperian Global works with international companies on a broad spectrum of talent development issues, including helping businesses improve their interactions with employees of different backgrounds.

a great deal that makes them more effective global leaders. But I think everyone at the company also appreciates the business case for local talent development.

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*When you look at what Ford has accomplished in China over the last few years, it's truly astonishing.*

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When you look at what Ford has accomplished in China over the last few years, it's truly astonishing. Four years ago I went to Chongqing and saw a leveled site, ready for construction; by the next year another factory building was up and full of equipment. Today, the city boasts Ford's largest manufacturing concentration outside of Michigan. Despite the obvious difficulties of creating a workforce from scratch, the China plants have earned some of the highest internal quality ratings within Ford. And they've done that with a workforce averaging just 28 years old. Ford's market share is growing rapidly, and many buyers are attracted to Ford vehicles because of their reputation for quality and safety.

Ford's Human Resources organization has put an emphasis on creating leaders who know how to lead as well as leaders who know how to manage. Managers at Ford are highly adept at taking on a complex set of tasks and turning that into a workable plan, very often in a fast-moving, fast-changing environment. These are critical skills in established markets, but even more so in places like Asia Pacific, where one has to work within new geographies and with new teams. In addition to having strong management skills, employees who move to higher levels within the organization need to be able to lead by exerting influence across boundaries, creating a compelling vision and business case for what they would like to accomplish, and inspiring colleagues who may come from very different backgrounds.

Ford does have its work cut out for it in Asia, having come to the region later than many other automakers. That means Ford must be even more aggressive and innovative when competing with those vehicle makers that are more deeply entrenched. Additionally, turnover rates in the region are high since workers have many options for employment and career development, requiring Ford to focus on building even stronger employee engagement.

Maintaining a global mindset is critical to success in the 21st century. Over the decades, Ford has learned the hard way that you can't take a one-size-fits-all approach for every market, and that you also cannot be too regionalized or too local. A global mindset isn't just about how to create products that appeal to specific countries or regions, although this is important. It's about finding the optimum combination of global efficiency and regional tailoring.

Ford is respected around the world because of its history. Going forward, I think it's critical that people within the Ford system – regardless of their country of origin – feel they have opportunities to advance as far as their own merits can take them. It doesn't matter if you're from Chennai or Chongqing, South Africa or Germany, the U.K. or North America. The key to retention and engagement is leadership that creates opportunities for the business and helps all employees feel they have a future in the company based on their performance, no matter where in the world they came from.”

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Our People

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Voice: Ernie Gundling

Spotlight: Building a Globally Mobile Workforce

# Spotlight: Building a Globally Mobile Workforce



We're developing a globally mobile workforce to deliver innovation.



People + Skills + An Increasingly Complex Global World =  
Developing a Globally Mobile Workforce to Help Us Deliver Innovation

Globally connected, increasingly complex and changing at an ever-faster rate – these are the realities of our world today. As cultural and business complexity increases, so does the need for a global workforce that is mobile, adaptable and innovative. With markets, employees and host communities on six continents, Ford is fostering a workforce that can move and succeed across the organization and world – a workforce that is locally aware, globally mobile and focused on delivering innovative mobility solutions.



Megatrend: **The world of opposites**

**Local vs. Global** – Globalization has many benefits but also some disadvantages. As the world tries to grapple with the downsides, the needs of the global community will compete with local priorities.

> [Global Megatrends](#)

Ford has made a substantial commitment to cultivating leaders suited to a global marketplace, investing in training and global mobility programs that equip

leaders to succeed in varied global contexts and that rapidly build local leadership.

Cultural awareness and other global mobility training programs give our people the tools and strategies they need to communicate effectively with their counterparts in other countries, to make smooth transitions to new cultural contexts, to adapt management styles to local realities, and to build an efficient and enjoyable work environment. We are seeing real results from these efforts, including more satisfied employees and a more successful business. For example, we are increasing share in many of our markets, particularly fast-growth markets such as India and China.

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*We are cultivating  
leaders suited to a global  
marketplace.*

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*Our global mobility programs focus on effective communication,  
successful transition to the cultural context, and a well-adapted  
management style.*

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In these rapidly growing markets, there is a particular need to develop our people into globally minded leaders. In the past, global enterprises have spent 20 years developing local people for global leadership roles. However, we no longer have that luxury – we need to develop leaders at a pace that will enable us to respond to business opportunities in these fast-growing markets. Ford is identifying emerging market leaders and providing them with accelerated development plans to build their leadership capabilities and give them opportunities to learn, including exposure to and interaction with other leaders and operations from across the globe.

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*Ford is identifying emerging market leaders and providing them with  
accelerated development plans.*

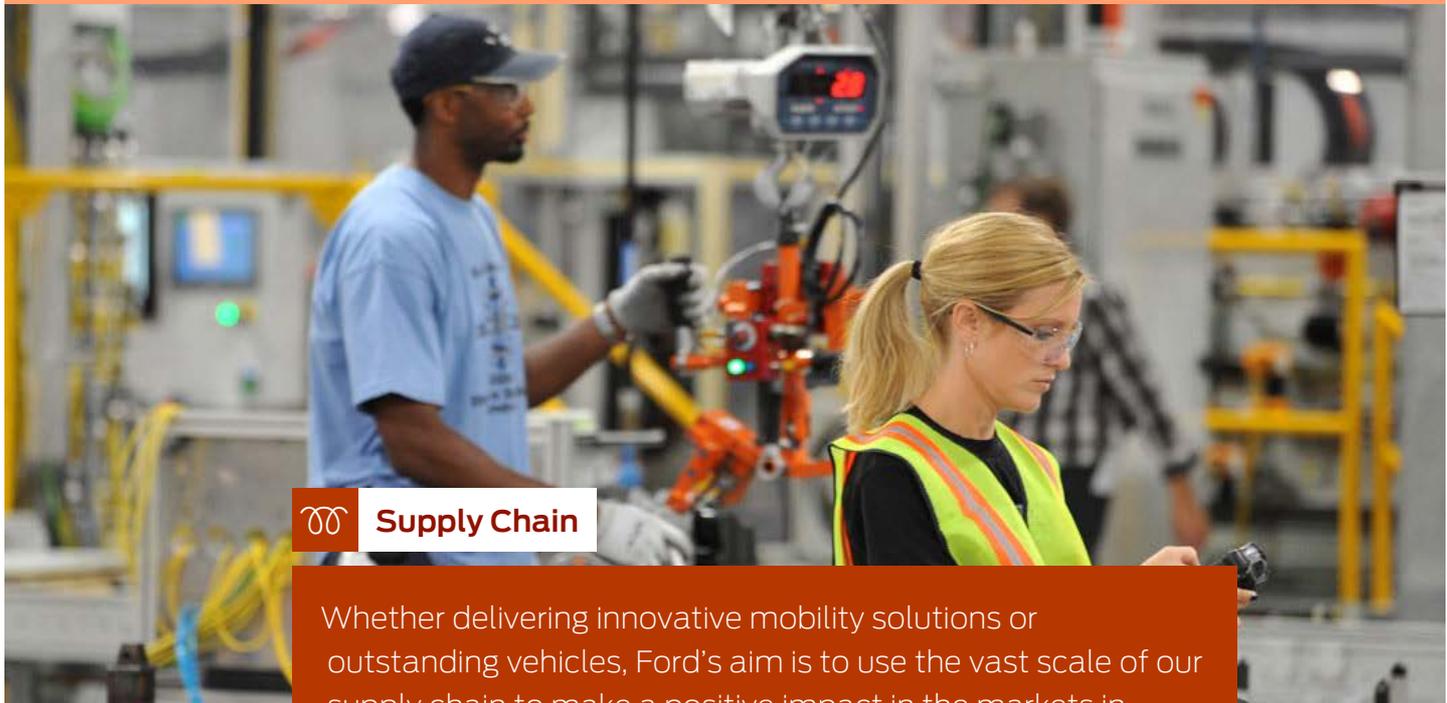
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Global leadership development and people mobility will position Ford for the future by creating a workforce that is able to build trusting relationships with people who are different from them and demonstrate respect and empathy. We're cultivating more than just good managers; we're cultivating great leaders who can operate in any part of the world.

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## Supply Chain

Whether delivering innovative mobility solutions or outstanding vehicles, Ford's aim is to use the vast scale of our supply chain to make a positive impact in the markets in which we do business globally.

### Supply Chain

Creating a Sustainable Supply Chain

Supply Chain Overview

Human Rights and Working Conditions in Our Supply Chain

Environmental Sustainability in Our Supply Chain

Conflict Minerals in Our Supply Chain

Supplier Diversity

Logistics Operations

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### Protecting Human Rights

Our Code of Human Rights, Basic Working Conditions and Corporate Responsibility applies to our own operations as well as to our \$100 billion supply chain.

> [Human Rights and Working Conditions in Our Supply Chain](#)



### Environmental Sustainability

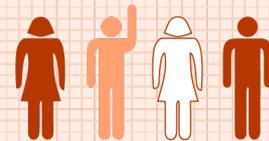
We're working with our suppliers to reduce their environmental footprints and better understand environmental impacts throughout the automotive supply chain.

> [Environmental Sustainability in Our Supply Chain](#)



### Conflict Minerals

When tin, tungsten, tantalum and gold are in our products, Ford seeks to use only those from conflict-free sources.



### Supplier Diversity

Since 1978, Ford's Supplier Diversity Development program has been supporting minority- and women-owned businesses and creating business

> [Conflict Minerals in Our Supply Chain](#)

opportunities for diverse suppliers.

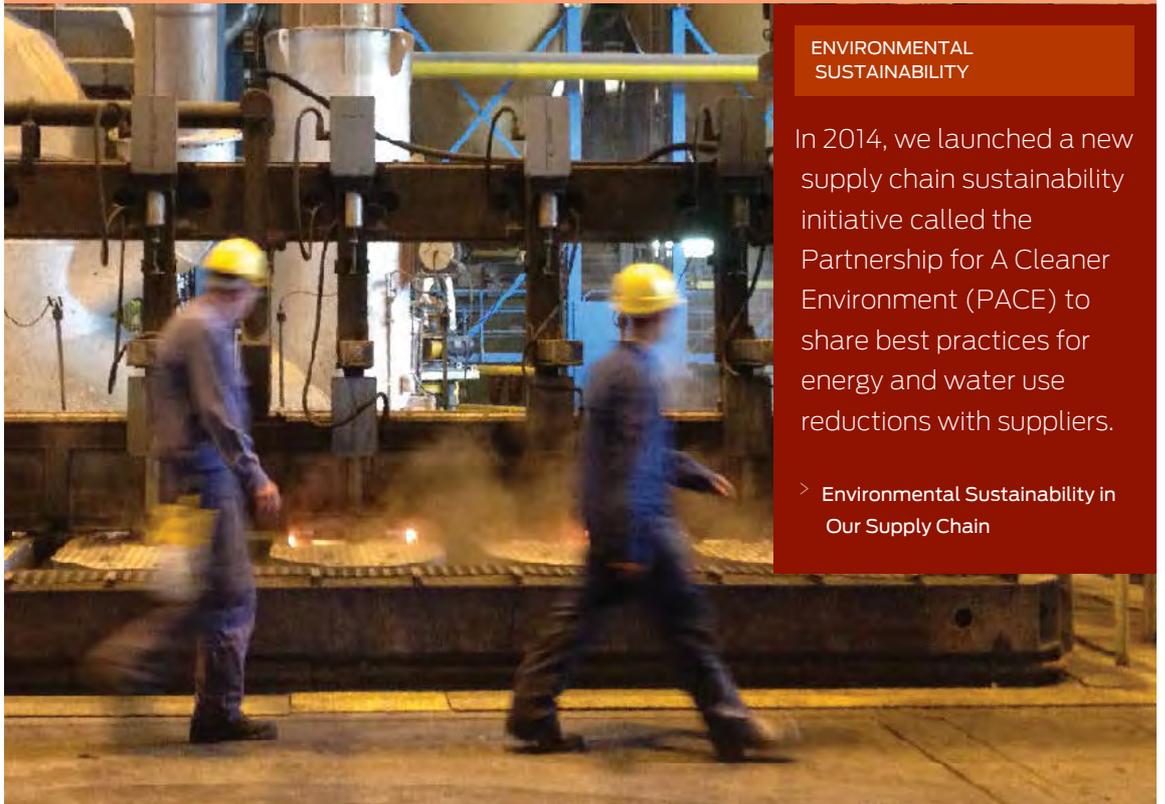
> [Supplier Diversity](#)

#### PROTECTING HUMAN RIGHTS

Our human rights and working conditions program – including training, supplier assessment and industry collaboration – is an integral part of our efforts to develop sustainable suppliers.

> [Human Rights and Working Conditions in Our Supply Chain](#)

In 2014, **280** suppliers in six high-priority countries were trained on corporate social responsibility.



#### ENVIRONMENTAL SUSTAINABILITY

In 2014, we launched a new supply chain sustainability initiative called the Partnership for A Cleaner Environment (PACE) to share best practices for energy and water use reductions with suppliers.

> [Environmental Sustainability in Our Supply Chain](#)

#### CONFLICT MINERALS

Ford's goal is to not only use conflict-free sources of minerals, but also continue to support responsible in-region mineral sourcing from the



Democratic Republic of the Congo (DRC) and adjoining countries.

> [Conflict Minerals in Our Supply Chain](#)

We have sourced  
**\$80 billion** in  
purchases from  
minority-, women-  
and veteran-owned  
businesses since  
1978.

#### SUPPLIER DIVERSITY

Ford's Supplier Diversity Development program seeks to support minority- and women-owned businesses, create business opportunities for diverse suppliers to grow, and further strengthen the diversity of the Ford supplier network.

> [Supplier Diversity](#)

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Supply Chain

> **Creating a Sustainable Supply Chain**

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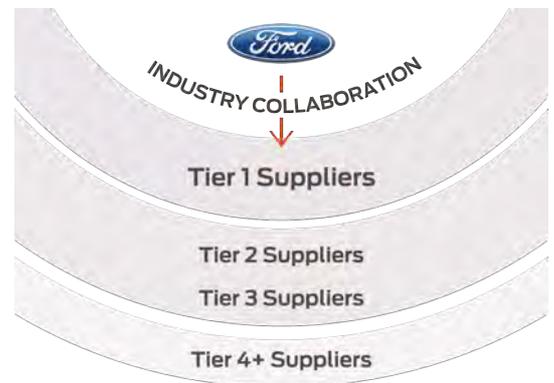
# Creating a Sustainable Supply Chain

Automakers like Ford rely on thousands of suppliers to provide the materials, parts and services necessary to make our final products.

We promote long-term relationships with our suppliers and seek alignment with them on sustainability-related issues such as human rights, working conditions and environmental responsibility.

We leverage the scale of our supply chain to make a positive impact in the markets in which we do business globally. Our goals to control costs, improve quality and meet sustainability targets require strong relationships and shared commitments with our suppliers.

We proactively engage our supplier partners to develop a sustainable supply chain. Specifically, we:

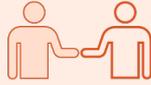


Quantify supplier environmental impact through CDP Supply Chain, Freight Emissions & Substances of Concern Reporting.

Conduct supplier third-party social responsibility audits. Collect supplier Conflict Minerals Report.

## Build Capability

Build our suppliers' environmental and social capability



### Social

Conduct supplier corporate social responsibility training. Work with ABF suppliers<sup>1</sup> to develop a Code of Conduct. Cascade expectations to sub-tier suppliers. Improve quality of Conflict Minerals Report. Increase supply chain transparency and conflict-free smelter capacity.



### Environment

Share best practices for energy and water reductions. Implement new freight reporting methods. Optimize packaging. Increase the use of recyclable, renewable and lightweight material content.

## Collaborate

Collaborate with industry and cross-industry organizations to develop common solutions in a non-competitive environment



### Industry

AIAG<sup>2</sup>, CSR Europe<sup>3</sup> Automotive workgroup, VDA<sup>4</sup> & Supplier Partnership for the Environment.



### Cross-Industry

UN Global Compact Supply Chain, CDP Supply Chain<sup>5</sup>, gBCAT<sup>6</sup>, PPA<sup>7</sup>, MSG<sup>8</sup>, EICC<sup>9</sup>, CFSI<sup>10</sup>, CERES<sup>11</sup>, Governments, NGOs and University partners.

1. [Aligned Business Framework suppliers](#)
2. AIAG - [Automotive Industry Action Group](#)
3. CSR Europe - [The European Business Network for Corporate Social Responsibility](#)
4. VDA - [Verband der Automobilindustrie](#) (German Association of the Automotive Industry)
5. CDP Supply Chain - [Carbon Disclosure Supply Chain Program](#)
6. gBCAT - [Global Business Coalition Against Trafficking](#)
7. PPA - [Public-Private Alliance for Responsible Mineral Trade](#)
8. MSG - [Multi-Stakeholder Group](#)
9. EICC - [Electronic Industry Citizenship Coalition](#)
10. CFSI - [Conflict Free Sourcing Initiative](#)
11. [CERES](#)

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Supply Chain

Creating a Sustainable Supply Chain

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ABF Suppliers

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# Supply Chain Overview

The automotive supply chain is one of the most complicated of any industry. There are often six to 10 levels of suppliers between an automaker and the source of raw materials that enter the manufacturing process.

The breadth, depth and interconnectedness of the automotive supply chain make it challenging to effectively manage business and sustainability issues. Respecting human rights and environmental issues in the supply chain is ultimately our suppliers' responsibility. As customers, however, we play an active role in supplier development and have adopted various means to clearly communicate our expectations to our suppliers.

On this page:

- ↓ [Supply Chain Standards](#)
- ↓ [Supplier Selection and Screening](#)
- ↓ [Supplier Engagement](#)
- ↓ [ABF Supplier Framework](#)
- ↓ [World Excellence Awards](#)

Total Global Buy

\$100+ bn



Production Suppliers

60+

Countries in which suppliers are located



4,400

Supplier sites



22

High-risk emerging markets



100,000+

Parts currently being manufactured



62

Ford manufacturing sites



500+

Production commodities to manage



1,200+

Supplier companies (Tier 1)



Indirect Suppliers

11,000+  
Supplier companies



650+  
Indirect commodities



## Supply Chain Standards

In our standard production procurement process, we issue purchase orders that incorporate our Global Terms and Conditions (GT&Cs). The GT&Cs are further supplemented by our web-guides, which expand on our expectations and suppliers' obligations on specific topics. For example, our Social Responsibility and Anti-Corruption Web-Guide outlines our prohibition of child labor, forced labor (including human trafficking), physical disciplinary abuse and any infraction of the law. Our Environmental Web-Guide sets out environmental requirements, including the elimination of materials of concern and increasing the use of sustainable materials whenever technically and economically feasible.

Also see:

> [Sustainable Materials](#)

Internally, we have adopted Policy Letter 24, our Code of Human Rights, Basic Working Conditions and Corporate Responsibility, to address workplace issues such as working hours, child labor, forced labor, nondiscrimination, freedom of association, health and safety and the environment. This policy applies to our own operations, and we encourage businesses throughout our supply chain to adopt and enforce similar policies in their own operations. Furthermore, we seek to identify and do business with companies that have aligned standards consistent with Policy Letter 24, including working to cascade these expectations throughout their own supply chain.

Also see:

[Policy Letter No. 24: Code of Human Rights, Basic Working Conditions, and Corporate Responsibility](#) (pdf, 55b)

## Supplier Selection and Screening

Suppliers are selected based upon their ability to provide Ford with quality parts, technology and innovation on a competitive basis. We gain cross-functional input for sourcing decisions from our Purchasing, Product Development, Supplier Technical Assistance, Finance, and Material Planning and Logistics departments. Due diligence of supplier capability is required when a new supplier is added to the supply base. In 2015, we plan to pilot a sustainability self-assessment questionnaire to assess the alignment of any new parent supplier with our established sustainability expectations. This questionnaire will address topics such as human rights, the environment, ethics, and health and safety.

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*In 2015, we plan to pilot a sustainability self-assessment questionnaire.*

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## Supplier Engagement

Supplier communication is a key component of our ability to establish strong relationships with our suppliers. We have established several forums for supplier communication at all levels of the organization and include multiple cross-functional stakeholders. Examples include:

- Global Top Supplier Meeting and World Excellence Awards
- Regional Top Supplier Meetings
- Aligned Business Framework (ABF) dialogues
- Executive Business Technical Review

- Business Unit Reviews
- Quarterly business update calls
- Participation in supplier and industry association events

## ABF Supplier Framework

We have developed an Aligned Business Framework (ABF) with our most strategic suppliers, which helps to improve quality, drive innovation, achieve operational synergies and encourage shared commitments to meet sustainability goals. ABF agreements – which were launched in 2005 and most recently updated in 2014 – comprehensively and formally spell out business practices designed to increase future collaboration, extend sourcing and increase data transparency.

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*ABF agreements are in place with strategic suppliers and specify key business practices.*

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## Ford's ABF Suppliers

As of the end of 2014, the ABF network included 106 companies, including 80 production and 26 indirect suppliers from around the world. Minority- and women-owned suppliers make up more than 10 percent of the supplier profile.

Also see:

> [ABF Suppliers](#)

## World Excellence Awards

As part of the annual World Excellence Award process, Ford recognizes suppliers for outstanding supplier performance in various categories, including sustainability, quality, cost, performance and delivery. In May 2014, Ford recognized 51 global suppliers with World Excellence Awards, including two suppliers for their sustainability performance: Laird Technologies and Maersk Lines. In May 2015, we will again recognize the performance of our suppliers at our annual World Excellence Award Ceremony.

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*Our World Excellence Awards recognize suppliers for outstanding performance.*

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# ABF Suppliers

On this page:

↓ [ABF Production Suppliers](#)

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## ABF Production Suppliers

**Production Suppliers** = Suppliers of parts that end up on the vehicles Ford manufactures

- Akebono
- Asahi Glass Co. Ltd.
- Autoliv
- Automotive Lighting
- Autoneum
- Axalta
- BASF Corporation
- Benteler Automobiltechnik GmbH
- BorgWarner Inc.
- Bosch
- Brembo
- Brose
- Central Glass America Inc.
- Continental Tires
- Cooper-Standard Automotive Inc.
- Dakkota<sup>1</sup>
- Dana Holding Corporation
- Delphi
- Denso
- Detroit Manufacturing Systems<sup>1</sup>
- Detroit Thermal Systems<sup>1</sup>
- Diamond Electric Mfg. Group
- Citic Dicastal Wheel Manufacturing
- Eisenwerk Brühl GmbH
- Faurecia
- FCC (Adams) LLC
- Federal-Mogul Corporation
- Flex-N-Gate<sup>1</sup>
- Foster
- GETRAG Ford Transmissions (Getrag/Ford Joint Venture)

- GKN
- Grupo Antolin <sup>1</sup>
- Hankook
- Hella
- Hitachi-Clarion
- HUSCO Automotive
- IAC
- Inalfa Roof Systems
- Inergy
- Johnson Controls Inc. (JCI)
- Johnson Matthey
- Kautex Textron GmbH & Co. KG
- Key Safety Systems
- Kiekert
- KSPG Group
- Lear Corporation
- Linamar
- Magna International Inc.
- MANN+HUMMEL
- Martinrea International
- Maxion Wheels
- Metalsa
- Michelin Automotive Tires
- Mitsubishi Electric USA
- Muhr und Bender KG
- Neapco
- NemaK
- PPG Industries
- Panasonic (Sanyo)
- Piston Automotive <sup>1</sup> LLC
- Pirelli Tires
- Prime Wheel <sup>1</sup>
- Ronal Wheels
- Samvardhana Motherson Group
- Sharp
- Sonavox Audio Solutions
- Superior Automotive
- Takata Holdings Inc.
- Tenneco Inc.
- Thai Summit America Corporation
- Thyssen Krupp AG
- Toyoda Gosei
- Trelleborg
- TRW Automotive
- Umicore Group
- Valeo
- Visteon Corporation
- Webasto
- Yazaki Company

- ZF International

## ABF Indirect Suppliers

Indirect Suppliers = Suppliers of facilities, materials and services

- Active Aero Services
- Aristeo
- Blue Hive
- Cisco Systems Inc.
- Cross Country Automotive Services
- Devon Industrial Group<sup>1</sup>
- Durr
- EWI Worldwide
- Ewie<sup>1</sup>
- Federal Express (FedEx)
- Global Parts & Maintenance
- Gonzalez Production Systems<sup>1</sup>
- Imagination
- Kajima Overseas Asia Pte Ltd
- KUKA Automation Company
- MAG Automation
- Microsoft
- MSX International
- Penske Corporation
- Percepta
- Roush Enterprises
- Team Detroit
- Union Pacific
- UniWorld Group<sup>1</sup>
- Waldbridge
- Zubi Advertising<sup>1</sup>

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1. Minority- or Women-owned Business Enterprise

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# Human Rights and Working Conditions in Our Supply Chain

First established in 2003, our human rights and working conditions program is an integral part of our effort to develop sustainable suppliers.

We aim to ensure that everything we make – or others make for us – is produced consistent with local law and our own commitment to protecting human rights, which is embodied in our [Policy Letter 24](#), [our Code of Human Rights, Basic Working Conditions and Corporate Responsibility](#) (pdf, 54.3Mb). This can be challenging, as we have less control in suppliers' facilities than in our own, particularly at the sub-tier levels (i.e., our suppliers' suppliers), where the risk for substandard working conditions is often heightened.

Our approach to building supplier capability in the area of human rights and working conditions includes the following:

1. [Risk profile and analysis](#)
2. [Supplier training and education](#)
3. [Supplier third-party assessments](#)
4. [Industry collaboration](#)
5. [Going Further actions](#)

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# Risk Profile and Analysis

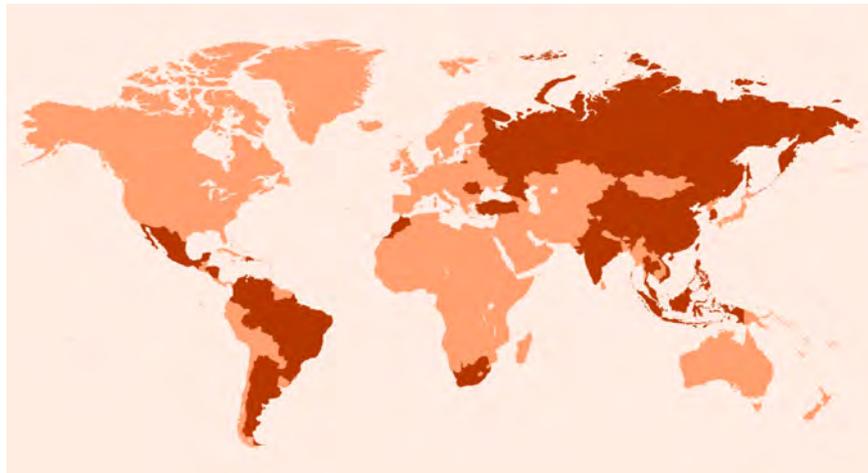
Given the size and global reach of our supply base, we prioritize our training and assessment efforts on suppliers located in countries that pose the highest risk for substandard working conditions.

Each year we perform a risk analysis that considers external data, including input from external stakeholders, and internal data. The internal data includes:

- The amount we spend annually with that supplier;
- The supplier's location;
- The commodity or commodities being supplied; and
- Our training and assessment history with the supplier.

In 2014, as a result of this analysis, we added Indonesia to our list of high-priority countries, increasing the total to 22 countries. The high-priority country list, combined with our training and assessment history in a given country and engagement with our regional buying community, is used to prioritize our training and assessment efforts.

**Human Rights and Working Conditions Program Focus Countries**



**Americas**

Argentina, Brazil, Colombia, Dominican Republic, Honduras, Mexico, Nicaragua and Venezuela

**Asia**

China, India, Indonesia, Malaysia, the Philippines, South Korea, Taiwan, Thailand and Vietnam

**Europe, Middle East and Africa**

Morocco, Romania, Russia, South Africa and Turkey

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# Supplier Training and Education

Supplier training on human rights issues is essential to help our suppliers build their capability to responsibly manage working conditions in their facilities.

We recognized from the outset that conducting training sessions in conjunction with other automakers reaches a greater number of suppliers in the most efficient manner. As such, we have worked with other automakers through the Automotive Industry Action Group (AIAG) and CSR Europe to develop a set of guidelines – called the [Automotive Industry Guiding Principles to Enhance Sustainability Performance in the Supply Chain](#) (pdf, 219kb) – that establish a shared industry voice and serve as the foundation for our training program.

While most of Ford's supplier training is implemented through the AIAG or CSR Europe in conjunction with other automakers, we continue to supplement these training sessions with Ford-specific workshops, as needed.

*We work with other automakers on supplier training and education.*

## Training Approach

Supplier training sessions – whether conducted by Ford, the AIAG or CSR Europe – are customized to align with the unique laws and requirements of each country. The training sessions emphasize how human rights topics are covered in:

- Local legal standards
- Industry guidelines developed by participating automotive OEMs
- International best practices

In addition, the trainings include strategies for developing effective management systems, and they cover the business benefits of promoting social and environmental responsibility.

Facilitated by qualified trainers and involving multiple automotive suppliers whenever possible, participants generally include managers from the human resources, health and safety, and/or legal departments from supplier companies. The sessions use a “train-the-trainer” approach to expand the scope and impact of the training. Participating suppliers are required to cascade the training materials to management and all personnel within their own company as well as to their direct suppliers. Ford requires confirmation that the training information is cascaded to the entire factory population and to direct suppliers within four months of the training session.

*Participating suppliers are required to cascade training materials within their company and to their direct suppliers.*

## Training Results

Since 2005, Ford has led or participated in training sessions in Argentina, Brazil, China, India, Mexico, Romania, Russia, Thailand, Turkey and Venezuela. In 2014, we held joint industry trainings through the AIAG in Russia and conducted independent Ford training sessions in Brazil, China, India, Mexico and Turkey. Overall, we trained more than 280 Ford suppliers – both direct and indirect. In 2014, we also included indirect suppliers in our training sessions. In 2015, we intend to participate in training sessions in Brazil, China and Mexico with the AIAG and in South Africa with CSR Europe. We also plan to conduct a Ford-sponsored training in Thailand.

#### Training Data

	2013	2014	Program Total <sup>1</sup>
Training Sessions Conducted <sup>2</sup>	14	7	149
Total Sites Trained/Retrained	233	280	2,948

1. Program total represents data from 2005 to 2014.

2. In 2014, training was conducted without other OEMs, requiring fewer training sessions as compared to 2013. This was due to the fact that AIAG was revamping their training materials.

## Industry Training – Next Steps

In 2015, Ford participated in the development and launch of a modified training approach through the AIAG. All elements of the modified curriculum remain aligned to the expectations in the [Automotive Industry Guiding Principles](#) described above. The new approach involves three phases:

- **AIAG Supply Chain Sustainability e-Learning:** The e-learning module will include a basic introduction to the ethics, human rights and environmental concepts presented in the Guiding Principles.
- **AIAG Supply Chain Knowledge Assessment:** The interactive knowledge assessment is designed to assess a participant’s knowledge of the topics included in the e-learning and provide analytic data to customize face-to-face workshops.
- **Face-to-Face Workshops:** The in-country workshop sessions are intended to focus on specific country laws and best practices. The workshops are designed to encourage open dialogue with suppliers from multiple OEMs.

Both the e-learning and the knowledge assessment will launch in the second quarter of 2015 and will be available in Chinese, English, Italian, Portuguese, Spanish and Turkish. Also, both will be available free of charge to OEMs and sub-tier suppliers. All enhancements made to the AIAG training will also be shared with CSR Europe to ensure a consistent message to our global suppliers.

## Internal Training

We strongly believe it is important to develop not only supplier capability on these issues, but also our own internal capability. In 2014, we trained 175 new Ford Purchasing employees on supply chain sustainability fundamentals. We also provided training to our global Supplier Technical Assistance (STA) team on our human rights and working conditions program, as these personnel interact with our supplier plants on a regular basis. STA training reached almost 1,400 Ford employees globally. In 2015, we plan to train the broader Ford Purchasing community.

**READ MORE:**

> [Industry Collaboration](#)

External websites:

 [Working Conditions Training and Assessment Status for Supply Chain](#)

 [Automotive Industry Action Group \(AIAG\)](#)

 [CSR Europe](#)

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# Assessing Suppliers

Since 2003, we have conducted almost 1,000 third-party social responsibility assessments of Tier 1 suppliers in our [22 high-priority countries](#).

The assessments provide feedback to Ford and our suppliers regarding how well the suppliers are meeting legal requirements and our expectations. Ford conducts the assessments independent of other OEMs, with the intent to work collaboratively with our suppliers, improve their operations and develop a more sustainable supply chain.

## Assessment Approach

Individual supplier assessments, conducted by external, qualified social auditors, consist of:

- A pre-assessment questionnaire
- A thorough review of the facility
- A review of relevant documents
- Interviews with both management and employees

Audits are generally announced and coordinated with the supplier, as the intent of our program is to work collaboratively with our suppliers and improve their operations.

If any issues are identified during an assessment, the supplier is required to prepare a corrective action plan, which Ford reviews and approves. Audits can only be considered “closed” when all violations of local law and regulation are resolved and when the required management systems and policies have been implemented. Closure generally requires follow-up audits within 12 to 18 months as required to confirm resolution of the issues. Suppliers who continue to be out of compliance with Ford expectations and/or local laws are at risk of being removed from Ford’s supply base. In 2014, no suppliers were removed from the supply base due to sustainability concerns.

In 2014, we expanded our audits to pilot the process with indirect suppliers – i.e., those in the fields of healthcare, transportation, machinery and tooling, professional services, marketing and sales, IT, construction and industrial materials. The pilot has provided us with an understanding that our existing supplier engagement tools may need to be modified for indirect suppliers.

## Assessment Results

In 2014, we conducted 75 initial assessments and 53 follow-up assessments. Details of our audit activity are as follows:

Assessment Data
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*In 2015 we revised our external supplier audit to include more specific language regarding ethical recruiting.*

	2013	2014	Program Total <sup>1</sup>
Initial Assessments Conducted	63	75	990
Follow-Up Assessments Conducted	74	53	1,113

1. Program total represents data from 2003 to 2014.

Ford provides auditors with a list of key issues for which the auditor must immediately (within 24 hours) notify Ford if found during an audit. These issues include the presence of child workers, forced labor or physical disciplinary practices. We found no evidence of these issues in our 2014 audits.

We also require immediate notification of noncompliance with minimum wage, fraudulent books, attempted bribery and denied access to records. A few cases of denied access to records were identified. In these cases, we immediately engaged with the supplier and required full transparency, as outlined in our Global Terms and Conditions.

Finally, we are also notified of life-threatening situations (e.g., blocked exits, absent/defeated lock out procedures). In 2014, no issues that could not be immediately resolved were identified.

The following table shows the most prevalent issues identified in our 2014 audits:

Category	Percent of Initial Audits Conducted in 2014 with this Issue Identified	Number of Corrective Action Plans Established	Examples of the Most Prevalent Topics to be Addressed
<b>Emergency Preparedness</b>	75%	56	<ul style="list-style-type: none"> <li>• Lack of regular fire drills</li> <li>• Absence of identified evacuation routes in isolated areas</li> </ul>
<b>Working Hours</b>	60%	45	<ul style="list-style-type: none"> <li>• Noncompliance with maximum daily work hours during peak production times</li> <li>• Lack of required day off during peak production times</li> </ul>
<b>Occupational Safety</b>	31%	23	<ul style="list-style-type: none"> <li>• Unmarked electrical boxes</li> <li>• Lack of lock out/tag out procedures</li> </ul>
<b>Environment, Health and Safety Management Systems</b>	29%	22	<ul style="list-style-type: none"> <li>• Lack of robust metrics and regular performance measurement systems for health and safety</li> </ul>
<b>Industrial Hygiene</b>	28%	21	<ul style="list-style-type: none"> <li>• Unmarked chemicals</li> </ul>

Regular reviews are conducted with the supplier to ensure compliance with the agreed-upon to corrective action plan. If necessary, our commodity purchasing management is engaged to assist with issue resolution.

**READ MORE:**

 [Working Conditions Training  
and Assessment Status for  
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# Industry Collaboration

We view our participation in cross-industry forums such as the Automotive Industry Action Group (AIAG) and CSR Europe as critical to driving change within the automotive industry. The table below shows Ford's specific roles in these two organizations at present.

Also, as mentioned previously in this section, in 2014 the AIAG and CSR Europe aligned to a common set of guiding principles to enhance sustainability performance in the automotive supply chain. Through the member companies of both AIAG and CSR all told, 14 automakers (including Ford) have committed to the common principles to date. This collaboration is providing a common voice on these important issues among multiple OEMs across regions.

Also see:

[AIAG Corporate Responsibility Guidance Statements](#)

[CSR Europe Guiding Principles](#)

Organization and Committee	Ford's Involvement
AIAG – Working Conditions Oversight Committee	Ford co-chairs the Working Conditions Oversight Committee, which collaborates to develop effective tools to increase supplier capability and ensure proper human rights and working conditions in the automotive supply chain.
AIAG – Sustainability Supplier Self-Assessment Work Group	Ford participates in the AIAG work group developing a standardized tool for automotive supplier sustainability gap analysis.
CSR Europe – European Working Group on Supply Chain Sustainability	Ford actively participates in this European-based network seeking to improve social, ethical and environmental performance in the automotive supply chain.

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# Going Further Actions

On this page:

- ↓ [ABF Supplier Code of Conduct Alignment](#)
- ↓ [Pig Iron](#)
- ↓ [Human Trafficking](#)

## ABF Supplier Code of Conduct Alignment

For our strategic [Aligned Business Framework \(ABF\) suppliers](#) – which supply more than 65 percent of our annual buy – we have developed a rigorous process for managing sustainability issues that builds on the sustainability requirements in our supplier contracts.

We encourage our ABF suppliers to develop a shared commitment to our sustainability goals and effective systems for managing sustainability issues through a three-phase developmental process:



### 1. Verify Supplier Code of Conduct

Ford ensures that our ABF suppliers have a code of conduct aligned with Policy Letter 24, our Code of Human Rights, Basic Working Conditions and Corporate Responsibility.

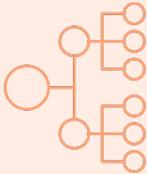
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### 2. Training and Compliance

As needed, Ford provides training to ABF suppliers. Also, ABF suppliers conduct their own internal trainings to ensure that their employees understand their code of conduct. Suppliers must also develop a rigorous compliance process supporting their code.

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### 3. Extend Expectations to Their Supply Chain

ABF suppliers extend our shared sustainability expectations to their own suppliers, expanding the impact of our sustainability goals throughout the multiple tiers of our supply chain.

## ABF Alignment Results

Ford's global Supply Chain Sustainability team has implemented a detailed review process for each of these three phases. To date, approximately 95 percent of our [Production ABF](#)

[suppliers](#) have demonstrated that they have codes of conduct in place that are aligned with international standards, and approximately 60 percent have demonstrated that they have met all three Ford milestones – that is, they have aligned codes of conduct in place supported by robust management systems governing their own operations and their supply chain.

## Pig Iron

A range of products and materials sourced from specific geographies have been identified and described by the U.S. Department of Labor as posing potential human rights concerns. Included on this list is charcoal from Brazil, which can be used to make pig iron, a key ingredient in steel production.

We have demonstrated our commitment to take swift and proactive action to address human rights concerns associated with pig iron. In the past, when charcoal produced in Brazil with the use of slave labor had found its way into the sub-tiers of our supply chain, we worked directly with our suppliers to eliminate the issue. This ultimately required a resourcing action within the supply chain, where in 2006, a supplier was desourced. In addition to working with our suppliers to ensure responsible procurement of this material, we have also worked with the U.S. State Department, the International Labour Organization and the governing committee of Brazil's National Pact to Eradicate Slave Labour to seek multilateral solutions that will help to validate information and improve transparency.

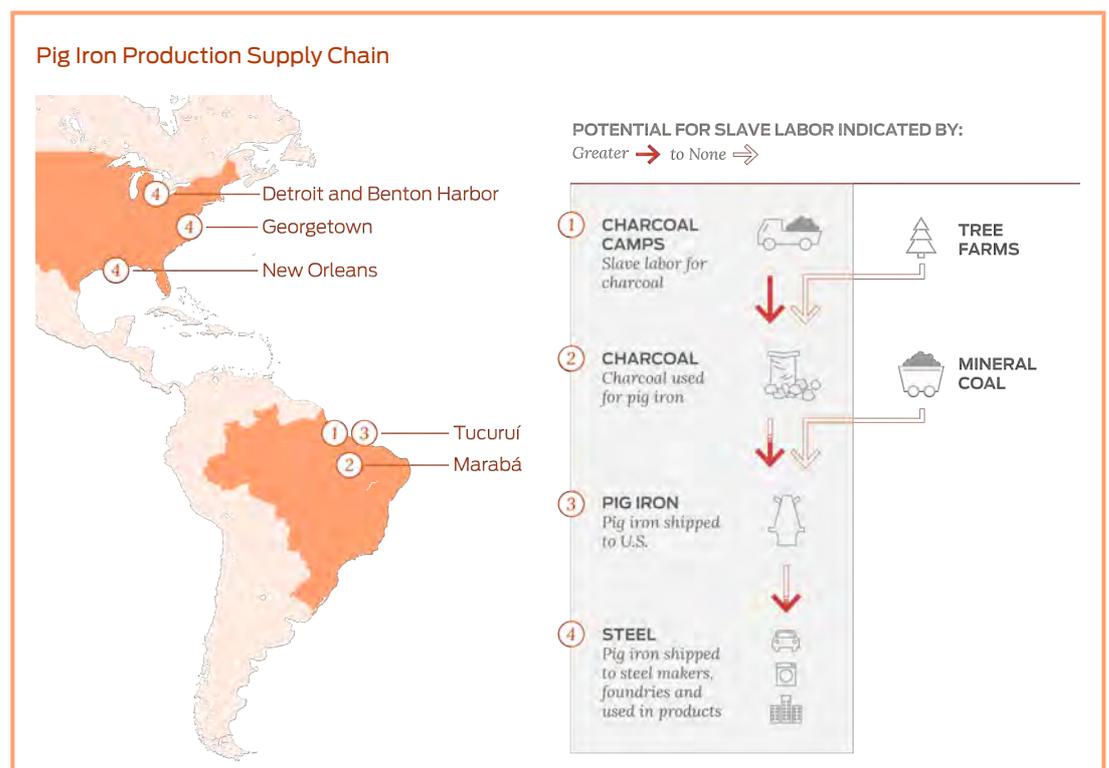
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*Ford is committed to take swift and proactive action to address human rights concerns associated with pig iron.*

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In 2014, our continued diligence in assessing our supply chain for potential human trafficking or forced labor issues involved a global query of our steel suppliers to determine their pig iron sourcing. We sought out assurances from these steel suppliers that forced labor was not employed anywhere in their value chain. This included an intensive mapping of five to six tiers of suppliers, including importers, exporters and trading companies. (See graphic below.) We requested additional detail regarding our Tier 1 suppliers' systems for safeguarding human rights throughout their operations, including procurement.

The review did not reveal any issues within our steel supply chain. Ford plans to begin similar efforts for other commodities in 2015 and future years.



## Human Trafficking

Effective Jan. 1 2012, companies doing business in the state of California are required to disclose their efforts (if any) to address the issue of forced labor and human trafficking, per the California Transparency in Supply Chains Act of 2010 (SB 657). Ford's [Policy Letter 24: Code of Human Rights, Basic Working Conditions and Corporate Responsibility](#) (pdf, 55b), clearly states that we will not tolerate forced labor (including human trafficking) or child labor in our operations and we conduct internal audits of our manufacturing locations to ensure compliance. Our processes include actions to safeguard against human rights abuses (including forced labor and human trafficking) in our supply chain, including:

We continue to build our capability to combat human trafficking in the supply chain by proactively engaging with our stakeholders. Our stakeholders include NGOs, industry and cross-industry manufacturers, and cross-industry associations such as the [Global Business Against Human Trafficking \(gBCAT\)](#).

- **Our Global Terms and Conditions forbid the use of forced labor, child labor and physically abusive disciplinary practices.** Our definition of forced labor is inclusive of human trafficking as outlined in our Policy Letter 24: Code of Human Rights, Basic Working Conditions and Corporate Responsibility. Ford's purchase orders require suppliers to certify compliance with our prohibition of forced labor, child labor and physical disciplinary abuse as part of our Global Terms and Conditions that govern the purchase by Ford of goods and services from suppliers. We reserve the right to terminate our relationship with a supplier if issues of noncompliance with our policies are discovered and/or noncompliance is not addressed in a timely manner.
- **We regularly assess risk related to human trafficking and forced labor associated with our supply base.** Our preliminary assessment is based upon geography, the commodity purchased, supplier quality performance and the nature of the business transaction. Ford performs this risk assessment with input from external stakeholders.
- **We conduct training and build capability.**
  - We regularly conduct internal training on our Policy Letter 24: Code of Human Rights, Basic Working Conditions and Corporate Responsibility with our Global Purchasing staff, including management and supplier quality teams. Additional training is conducted regarding our Supply Chain Sustainability Program, including coverage of the Code and our Global Working Conditions Program.
  - Ford requires suppliers in high-risk countries to attend training to increase their awareness of Ford's requirements and legal requirements, including those related to forced labor and child labor. The training section of this report further details our [supplier training efforts](#).
- **We regularly conduct audits of at-risk Tier 1 supplier factories to monitor compliance with Ford expectations and legal requirements.** These audits are independent and announced. We choose which facilities to audit based upon our risk assessment as described above. The [supplier assessment](#) section of this report further details our external auditing program.

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# Environmental Sustainability in Our Supply Chain

Ford is committed to reducing the environmental footprint of our vehicles, our operations and our supply chain.

For our own operations, we have a commitment and strategy to reduce greenhouse gas (GHG) emissions and water use, as detailed in the [Climate Change](#) and [Water](#) sections of this report. We are working to promote a similar commitment throughout the automotive supply chain.

*In this section:*

- > [Assessing the Environmental Impacts of Our Suppliers](#)
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# Assessing the Environmental Impacts of Our Suppliers

Since 2010, Ford has surveyed an increasing number of suppliers using the CDP Supply Chain program’s climate change questionnaire, to better understand the greenhouse gas (GHG) emissions of our supply base.

In 2014, we significantly expanded our scope by including additional suppliers and by asking suppliers to respond to the CDP Water questionnaire for the first time (see chart below). The two questionnaires gather qualitative and quantitative information about the suppliers’ management of climate risks, GHG emissions and water use.

	2010	2011	2012	2013	2014
Number of Suppliers Queried	35	128	135	145	250
% Ford’s Annual Spend	26	58	50	52	57

## Selecting the Suppliers

The production and indirect suppliers asked to respond to the questionnaires were selected based on a combination of:

- The GHG or water intensity of the suppliers’ activities or commodities supplied
- The geographic footprint of the supplier’s global operations, including those in water-stressed or water-scarce regions
- The strategic nature of the supplier’s business relationship with Ford

## Supplier Responses

In 2014 we achieved an overall response rate of 80 percent, exceeding our internal objectives for these voluntary surveys. This response rate also significantly exceeds the average response rate for all companies participating in the CDP Supply Chain Program, which stood at 52 percent in 2014. We attribute the high response rate to the active support and training Ford provided throughout the process, including supplier webinars, guidance documents and one-on-one technical assistance.

In addition, Ford’s supplier response rate for CDP Supply Chain reporting of GHG emissions exceeded that of the overall CDP supplier response rate on several key topics of the CDP survey, as shown below.

Response Topic	Response Rate for Ford Supplier CDP Respondents Only	Response Rate for All CDP Supply Chain Respondents
<b>Scope 1 and 2 emissions</b>	89%	71%
<b>Scope 3 emissions</b>	48%	35%
<b>Emissions Reductions Initiatives</b>	77%	51%

The number of Ford suppliers reporting GHG reduction targets on both an absolute and intensity basis has increased each year. This year, 69 percent reported having an emissions reduction target, and 80 percent reported integrating climate change into their business strategy.

Regarding water management, 36 percent of our respondents reported a water-related target or goal. Since this is our first year of participation in the CDP Supply Chain Water program, we regard this data as baseline and will continue to monitor and report this information annually.

In 2015, we plan to use the CDP Supply Chain's questionnaires to survey approximately 250 suppliers spanning various production commodity groups and geographical regions, as well as indirect suppliers that provide logistics and information technology services.

We also seek to work more closely with suppliers to improve the quality and consistency of the reported data. To assist in this effort, this year we partnered with other automotive OEMs through the Automotive Industry Action Group (AIAG) and developed a one-day supplier training program for calculating, allocating and reporting GHG emissions. We hope this supplier engagement will increase our response rate and improve the quality of information obtained through the CDP questionnaire.

The ongoing data obtained through the CDP survey will continue to help us identify "hotspots" for GHG emissions and water use. Once we understand which of our suppliers or commodities have the largest GHG and water footprints, we intend to work with them to achieve reductions.

In 2015, we plan to use the CDP Supply Chain's questionnaires to survey approximately

**250**  
suppliers

### Documenting Our Indirect Emissions: Scope 3 Greenhouse Gas Accounting and Reporting

Scope 3 greenhouse gas emissions include all of the upstream and downstream emissions generated by a company's value chain, from raw material extraction to end-of-life disposal or recycling. Assessing these emissions is extremely challenging, as it includes emissions generated by processes and entities far from Ford's own operations and direct suppliers. The World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD) finalized a new Scope 3 (Corporate Value Chain) GHG Emissions Standard in 2011 to help companies with this difficult task. The Scope 3 GHG Emissions Standard is used in conjunction with the GHG Protocol Corporate Accounting and Reporting Standard, providing companies with a methodology for reporting emissions from their own operations.

Also see:

> [Ford's Greenhouse Gas Footprint](#)

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## Building Supplier Capability

In late 2014, we launched a new environmental supply chain sustainability initiative – the Partnership for A Cleaner Environment (PACE) – to reduce the collective environmental footprint of Ford and our automotive supply chain.



Our goal is to teach our suppliers about the energy and water savings and waste reduction initiatives Ford has implemented across our plants, with the hope that our suppliers will implement some of these initiatives in their own manufacturing facilities. To further amplify environmental responsibility and sustainability impact further down the supply chain, we are also encouraging our Tier 1 suppliers to share these best practices with their own suppliers.

### The PACE Process



PACE consists of a five-step iterative process, illustrated above.

- **1.** Suppliers create roadmaps – multi-year plans for increasing environmental performance through either greenhouse gas (GHG) emission reductions or water use reductions – and report progress.
- **2.** Baseline environmental data is entered into the roadmap.
- **3 and 4.** As best practices are implemented, the reductions in GHG emissions or water use are calculated, and progress toward goals is reported against the baseline.
- **5.** Best practice lists are periodically updated to include additional best practices reported to us by our suppliers or implemented in our own facilities.

PACE is expected to be particularly valuable in helping our suppliers report their environmental data and improve their sustainability

*PACE has been piloted*

performance. As suppliers implement the best practices, they will also be better equipped to report GHG emissions and/or water use reductions through the annual CDP questionnaires.

*with 10 suppliers and will be rolled out to up to 50 suppliers through 2015.*

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Through February 2015, the PACE program was in its pilot phase with a select group of 10 suppliers. Ford has received positive reaction to this voluntary program from those involved. Candid feedback provided by the pilot suppliers will be reviewed and program improvements implemented prior to expansion to 25 to 50 suppliers through the remainder of 2015.

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# Collaborating with Industry Partners

To magnify our efforts and encourage common approaches to environmental issues in the automotive supply chain, we participate in several industry forums.

Key examples include the following:

- Ford founded and co-chairs the Environmental Sustainability Advisory Group of the Automotive Industry Action Group (AIAG). The advisory group monitors key environmental issues in the industry and helps to develop common metrics, standards and benchmarks in an effort to improve the effectiveness and efficiency of member companies' and industry groups' sustainability efforts. The group educates suppliers and manufacturers in the industry about key environmental issues and serves as an industry "think tank" on environmental sustainability.
- Ford worked with the AIAG's Greenhouse Gas and Environmental Sustainability Advisory Group in integrating environmental sustainability and greenhouse gas management issues across the industry.
- Since 2007, Ford has served as a member of the Suppliers Partnership for the Environment, a partnership between automotive OEMs, their suppliers and the U.S. Environmental Protection Agency.

*We are working with the AIAG on common metrics, standards and benchmarks.*

**READ MORE:**

External websites:

- 🔗 [Automotive Industry Action Group \(AIAG\)](#)
- 🔗 [Suppliers Partnership for the Environment \(SP\)](#)

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# Conflict Minerals in Our Supply Chain

On August 22, 2012, the U.S. Securities and Exchange Commission (SEC) adopted the final rule to implement reporting and disclosure requirements concerning conflict minerals, as directed by Section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010.

The congressional mandate was designed to further the humanitarian goal of ending violent conflict in the Democratic Republic of the Congo (DRC) and adjoining countries.

### Definitions

- "3TG" means tantalum, tin, tungsten and gold
- "Conflict minerals" means gold as well as Columbite-Tantalite (coltan), cassiterite, wolframite, or their derivatives, which are limited to tantalum, tin and tungsten

In this section:

- > [Supplier Conflict Minerals Reporting Requirements](#)
- > [Conflict Minerals Policy](#)
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# Supplier Conflict Minerals Reporting Requirements

To comply with the conflict minerals rule, Ford is required to file an annual Specialized Disclosure report with the U.S. Securities and Exchange Commission (SEC) disclosing its conflict minerals status.

Suppliers that provide parts to Ford containing conflict minerals will be required to submit a Conflict Minerals Reporting Template (CMRT) to Ford annually.

When reporting, we encourage our suppliers to use the [Organization for Economic Co-operation and Development \(OECD\) Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas](#) to conduct due diligence on the chain of custody of the conflict minerals provided to Ford.

## Conflict Minerals Policy

To the extent tin, tungsten tantalum, and gold are contained in our products, it is Ford's goal to use DRC conflict free minerals while continuing to support responsible in-region mineral sourcing from the Democratic Republic of the Congo (DRC) and adjoining countries. As defined in Rule 13p-1 of the Securities Exchange Act of 1934 (the "Rule"), "DRC conflict free" means that a product does not contain conflict minerals necessary to the functionality or production of that product that directly or indirectly finance or benefit armed groups in the Democratic Republic of the Congo or an adjoining country.

Our suppliers are expected to conduct due diligence to understand the source of the conflict minerals used in Ford products, source responsibly, and not knowingly provide products containing minerals that contribute to conflict as described in the Rule. Suppliers are encouraged to use validated DRC conflict free smelters and refiners for procurement of tin, tungsten, tantalum and gold contained in Ford products.

The information provided by our suppliers is used to conduct our due diligence including assessing reports for completeness and consistency. We compare the smelter list provided by our suppliers with the [Conflict-Free Sourcing Initiative \(CFSI\)](#) list of compliant smelters to determine which smelters are DRC conflict free. Information provided by our suppliers is used in the development of our SEC filing documents.

### Definitions

- "3TG" means tantalum, tin, tungsten and gold
- "Conflict minerals" means gold as well as Columbite-Tantalite (coltan), cassiterite, wolframite, or their derivatives, which are limited to tantalum, tin and tungsten

*It is Ford's goal to use DRC conflict free minerals while continuing to support responsible in-region mineral sourcing.*

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# 2014 Supplier Scope and Metrics

Our Reasonable Country of Origin Inquiry (RCOI) focused on direct suppliers in either of the following two categories ("in-scope suppliers"):

- Suppliers of components or parts to our assembly plants if such suppliers have reported in the International Material Data System (IMDS) that their components or parts contain 3TG; or
- Suppliers that in the aggregate represent the top 80 percent of our expenditures for direct components and parts.

## In-Scope Supplier Response Statistics

	Percent	
	2013	2014
Provided CMRT	69	91
Did not provide CMRT	31	9

Data notes and analysis:

CMRT = Conflict Minerals Reporting Template

## Smelter List Submission Statistics

	Percent	
	2013	2014
Suppliers who submitted a Smelter List	20	41
Suppliers who did not submit a Smelter list	80	59

## Active/Compliant Smelter Statistics

	2013	2014
Active or compliant	48	70
Not participating in the audit program	52	30

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## Smelter List

Ford's supply chain includes 253 identified smelters based on supplier-submitted reports for calendar year 2014 (as of March 10, 2015).

Also see:

> [Ford's 2014 Smelter List](#)

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# Ford's 2014 Smelter List

Ford's supply chain includes 253 identified smelters based on supplier-submitted reports for calendar year 2014 (as of March 10, 2015).<sup>1,2</sup>

Metal	Smelter Name	Smelter ID
Gold	Almalyk Mining and Metallurgical Complex (AMMC)	CID000041
Gold	CCR Refinery – Glencore Canada Corporation	CID000185
Gold	Luoyang Zijin Yinhui Metal Smelt Co Ltd	CID001093
Gold	Aurubis AG	CID000113
Gold	So Accurate Group, Inc.	CID001754
Gold	The Great Wall Gold and Silver Refinery of China	CID001909
Gold	Ohio Precious Metals, LLC	CID001322
Gold	Matsuda Sangyo Co., Ltd.	CID001119
Gold	Tanaka Kikinzoku Kogyo K.K.	CID001875
Gold	Chugai Mining	CID000264
Gold	Kennecott Utah Copper LLC	CID000969
Gold	Metalor Technologies (Singapore) Pte. Ltd.	CID001152
Gold	Heimerle + Meule GmbH	CID000694
Gold	LS-NIKKO Copper Inc.	CID001078
Gold	AngloGold Ashanti Córrego do Sítio Mineração	CID000058
Gold	Kyrgyzaltyn JSC	CID001029
Gold	Ishifuku Metal Industry Co., Ltd.	CID000807
Gold	Advanced Chemical Company	CID000015
Gold	Daye Non-Ferrous Metals Mining Ltd.	CID000343
Gold	Eco-System Recycling Co., Ltd.	CID000425
Gold	SOE Shyolkovsky Factory of Secondary Precious Metals	CID001756
Gold	Umicore Brasil Ltda	CID001977
Gold	Metalor USA Refining Corporation	CID001157
Gold	Colt Refining	CID000288
Gold	Jiangxi Copper Company Limited	CID000855
Gold	Mitsui Mining and Smelting Co., Ltd.	CID001193
Gold	Japan Mint	CID000823
Gold	Umicore Precious Metals Thailand	CID002314
Gold	SAMWON METALS Corp.	CID001562

Gold	Hwasung CJ Co. Ltd	CID000778
Gold	Caridad	CID000180
Gold	Bauer Walser AG	CID000141
Gold	Nadir Metal Rafineri San. Ve Tic. A.Ş.	CID001220
Gold	Rand Refinery (Pty) Ltd	CID001512
Gold	Atasay Kuyumculuk Sanayi Ve Ticaret A.S.	CID000103
Gold	Heraeus Precious Metals GmbH & Co. KG	CID000711
Gold	Daejin Indus Co. Ltd	CID000328
Gold	Lingbao Gold Company Limited	CID001056
Gold	Lingbao Jinyuan Tonghui Refinery Co. Ltd.	CID001058
Gold	The Refinery of Shandong Gold Mining Co. Ltd	CID001916
Gold	Heraeus Ltd. Hong Kong	CID000707
Gold	Zhongyuan Gold Smelter of Zhongjin Gold Corporation	CID002224
Gold	JSC Ekaterinburg Non-Ferrous Metal Processing Plant	CID000927
Gold	Sabin Metal Corp.	CID001546
Gold	Aida Chemical Industries Co. Ltd.	CID000019
Gold	Zijin Mining Group Co. Ltd	CID002243
Gold	Do Sung Corporation	CID000359
Gold	Bangko Sentral ng Pilipinas (Central Bank of the Philippines)	CID000128
Gold	Moscow Special Alloys Processing Plant	CID001204
Gold	Johnson Matthey Ltd	CID000924
Gold	Materion	CID001113
Gold	Met-Mex Peñoles, S.A.	CID001161
Gold	Prioksky Plant of Non-Ferrous Metals	CID001386
Gold	Samduck Precious Metals	CID001555
Gold	Metalor Technologies (Hong Kong) Ltd	CID001149
Gold	United Precious Metal Refining, Inc.	CID001993
Gold	Doduco	CID000362
Gold	OJSC Kolyma Refinery	CID001328
Gold	Kojima Chemicals Co., Ltd	CID000981
Gold	Solar Applied Materials Technology Corp.	CID001761
Gold	Hunan Chenzhou Mining Group Co., Ltd.	CID000767
Gold	OJSC "The Gulidov Krasnoyarsk Non-Ferrous Metals Plant" (OJSC Krastvetmet)	CID001326
Gold	Gansu Seemine Material Hi-Tech Co Ltd	CID000522
Gold	Torecom	CID001955
Gold	FSE Novosibirsk Refinery	CID000493
Gold	C. Hafner GmbH + Co. KG	CID000176
Gold	Shandong Zhaojin Gold & Silver Refinery Co. Ltd	CID001622
Gold	L'azurde Company For Jewelry	CID001032
Gold	Yunnan Copper Industry Co Ltd	CID000197
Gold	Inner Mongolia Qiankun Gold and Silver Refinery Share Company Limited	CID000801

Gold	JX Nippon Mining & Metals Co., Ltd.	CID000937
Gold	Asahi Pretec Corporation	CID000082
Gold	Schone Edelmetaal	CID001573
Gold	PT Aneka Tambang (Persero) Tbk	CID001397
Gold	Navoi Mining and Metallurgical Combinat	CID001236
Gold	Dowa	CID000401
Gold	Asaka Riken Co Ltd	CID000090
Gold	Hangzhou Fuchunjiang Smelting Co., Ltd.	CID000671
Gold	Allgemeine Gold-und Silberscheideanstalt A.G.	CID000035
Gold	Ohura Precious Metal Industry Co., Ltd	CID001325
Gold	Kazzinc Ltd	CID000957
Gold	PX Précinox SA	CID001498
Gold	JSC Uralelectromed	CID000929
Gold	Western Australian Mint trading as The Perth Mint	CID002030
Gold	Argor-Heraeus SA	CID000077
Gold	Nihon Material Co. LTD	CID001259
Gold	Tokuriki Honten Co., Ltd	CID001938
Gold	Guangdong Jinding Gold Limited	CID002312
Gold	Umicore SA Business Unit Precious Metals Refining	CID001980
Gold	YAMAMOTO PRECIOUS METAL CO., LTD.	CID002100
Gold	China National Gold Group Corporation	CID000242
Gold	Metalor Technologies SA	CID001153
Gold	Chimet S.p.A.	CID000233
Gold	Istanbul Gold Refinery	CID000814
Gold	Penglai Penggang Gold Industry Co Ltd	CID001362
Gold	Yokohama Metal Co Ltd	CID002129
Gold	Korea Metal Co. Ltd	CID000988
Gold	Valcambi SA	CID002003
Gold	Boliden AB	CID000157
Gold	PAMP SA	CID001352
Gold	Sumitomo Metal Mining Co., Ltd.	CID001798
Gold	Mitsubishi Materials Corporation	CID001188
Gold	Johnson Matthey Inc	CID000920
Gold	Cendres + Métaux SA	CID000189
Gold	SEMPSA Joyería Platería SA	CID001585
Gold	Royal Canadian Mint	CID001534
Gold	Tongling nonferrous Metals Group Co.,Ltd	CID001947
Gold	Aktyubinsk	CID000028
Tantalum	Ulba	CID001969
Tantalum	JiuJiang JinXin Nonferrous Metals Co., Ltd.	CID000914
Tantalum	QuantumClean	CID001508

Tantalum	H.C. Starck GmbH Goslar	CID002545
Tantalum	Yichun Jin Yang Rare Metal Co., Ltd	CID002307
Tantalum	Plansee SE Liezen	CID002540
Tantalum	Global Advanced Metals Aizu	CID002558
Tantalum	H.C. Starck GmbH Laufenburg	CID002546
Tantalum	H.C. Starck Smelting GmbH & Co.KG	CID002550
Tantalum	KEMET Blue Metals	CID002539
Tantalum	D Block Metals, LLC	CID002504
Tantalum	Shanghai Jiangxi Metals Co. Ltd	CID001634
Tantalum	Global Advanced Metals Boyertown	CID002557
Tantalum	Metallurgical Products India (Pvt.) Ltd.	CID001163
Tantalum	Mineração Taboca S.A.	CID001175
Tantalum	Solikamsk Magnesium Works OAO	CID001769
Tantalum	Ningxia Orient Tantalum Industry Co., Ltd.	CID001277
Tantalum	Jiangxi Dinghai Tantalum & Niobium Co., LTD	CID002512
Tantalum	Exotech Inc.	CID000456
Tantalum	LSM Brasil S.A.	CID001076
Tantalum	Plansee SE Reutte	CID002556
Tantalum	Molycorp Silmet A.S.	CID001200
Tantalum	Mitsui Mining & Smelting	CID001192
Tantalum	Telex	CID001891
Tantalum	Changsha South Tantalum Niobium Co., Ltd.	CID000211
Tantalum	Taki Chemicals	CID001869
Tantalum	Jiujiang Tanbre Co., Ltd.	CID000917
Tantalum	KEMET Blue Powder	CID002568
Tantalum	Duoluoshan	CID000410
Tantalum	King-Tan Tantalum Industry Ltd	CID000973
Tantalum	Hi-Temp	CID000731
Tantalum	H.C. Starck Ltd.	CID002549
Tantalum	Hengyang King Xing Lifeng New Materials Co., Ltd.	CID002492
Tantalum	H.C. Starck Inc.	CID002548
Tantalum	RFH Tantalum Smeltry Co., Ltd	CID001522
Tantalum	H.C. Starck Hermsdorf GmbH	CID002547
Tantalum	H.C. Starck Co., Ltd.	CID002544
Tantalum	Guangdong Zhiyuan New Material Co., Ltd.	CID000616
Tantalum	Zhuzhou Cement Carbide	CID002232
Tantalum	Conghua Tantalum and Niobium Smeltry	CID000291
Tantalum	F&X Electro-Materials Ltd.	CID000460
Tin	Thaisarco	CID001898
Tin	PT Inti Stania Prima	CID002530
Tin	PT Karimun Mining	CID001448

Tin	Soft Metais, Ltda.	CID001758
Tin	Yunnan Tin Company, Ltd.	CID002180
Tin	PT REFINED BANGKA TIN	CID001460
Tin	CV JusTindo	CID000307
Tin	Yunnan Chengfeng Non-ferrous Metals Co.,Ltd.	CID002158
Tin	Huichang Jinshunda Tin Co. Ltd	CID000760
Tin	CV Makmur Jaya	CID000308
Tin	PT Babel Surya Alam Lestari	CID001406
Tin	OMSA	CID001337
Tin	O.M. Manufacturing Philippines, Inc.	CID002517
Tin	O.M. Manufacturing (Thailand) Co., Ltd.	CID001314
Tin	PT Seirama Tin investment	CID001466
Tin	PT Tambang Timah	CID001477
Tin	Linwu Xianggui Smelter Co	CID001063
Tin	China Rare Metal Materials Company	CID000244
Tin	Cooper Santa	CID000295
Tin	PT Tommy Utama	CID001493
Tin	PT Tinindo Inter Nusa	CID001490
Tin	CNMC (Guangxi) PGMA Co. Ltd.	CID000278
Tin	Melt Metais e Ligas S/A	CID002500
Tin	Alpha	CID000292
Tin	Gejiu Zi-Li	CID000555
Tin	CV Gita Pesona	CID000306
Tin	PT Koba Tin	CID001449
Tin	PT Stanindo Inti Perkasa	CID001468
Tin	PT Prima Timah Utama	CID001458
Tin	Dowa	CID000402
Tin	PT Belitung Industri Sejahtera	CID001421
Tin	PT ATD Makmur Mandiri Jaya	CID002503
Tin	EM Vinto	CID000438
Tin	PT Fang Di MulTindo	CID001442
Tin	Gejiu Kai Meng Industry and Trade LLC	CID000942
Tin	Minsur	CID001182
Tin	Jiangxi Nanshan	CID000864
Tin	Malaysia Smelting Corporation (MSC)	CID001105
Tin	Gejiu Non-Ferrous Metal Processing Co. Ltd.	CID000538
Tin	PT Pelat Timah Nusantara Tbk	CID001486
Tin	PT Bangka Putra Karya	CID001412
Tin	CV United Smelting	CID000315
Tin	Metallo Chimique	CID001143
Tin	PT Eunindo Usaha Mandiri	CID001438

Tin	Magnu's Minerai's Metais e Ligas LTDA	CID002468
Tin	PT Sariwiguna Binasentosa	CID001463
Tin	PT Sumber Jaya Indah	CID001471
Tin	Rui Da Hung	CID001539
Tin	PT Alam Lestari Kencana	CID001393
Tin	PT Mitra Stania Prima	CID001453
Tin	Mineração Taboca S.A.	CID001173
Tin	PT Babel Inti Perkasa	CID001402
Tin	PT BilliTin Makmur Lestari	CID001424
Tin	Mitsubishi Materials Corporation	CID001191
Tin	Estanho de Rondônia S.A.	CID000448
Tin	PT Yinchendo Mining Industry	CID001494
Tin	PT Panca Mega Persada	CID001457
Tin	Fenix Metals	CID000468
Tin	PT HP Metals Indonesia	CID001445
Tin	CV Nurjanah	CID000309
Tin	PT Bukit Timah	CID001428
Tin	China Tin Group Co., Ltd.	CID001070
Tin	PT Supra Sukses Trinusa	CID001476
Tin	CV Serumpun Sebalai	CID000313
Tin	White Solder Metalurgia e Mineração Ltda.	CID002036
Tin	PT Bangka Tin Industry	CID001419
Tin	Novosibirsk Integrated Tin Works	CID001305
Tin	PT Timah (Persero), Tbk	CID001482
Tin	PT Artha Cipta Langgeng	CID001399
Tungsten	Guangdong Xianglu Tungsten Co., Ltd.	CID000218
Tungsten	Jiangxi Yaosheng Tungsten Co., Ltd.	CID002316
Tungsten	Ganxian Shirui New Material Co., Ltd.	CID002531
Tungsten	Ganzhou Seadragon W & Mo Co., Ltd.	CID002494
Tungsten	Ganzhou Non-ferrous Metals Smelting Co., Ltd.	CID000868
Tungsten	Wolfram Company CJSC	CID002047
Tungsten	Jiangwu H.C. Starck Tungsten Products Co., Ltd.	CID002551
Tungsten	H.C. Starck GmbH	CID002541
Tungsten	Kennametal Fallon	CID000966
Tungsten	A.L.M.T. Corp.	CID000004
Tungsten	Jiangxi Minmetals Gao'an Non-ferrous Metals Co., Ltd.	CID002313
Tungsten	Kennametal Huntsville	CID000105
Tungsten	Xiamen Tungsten (H.C.) Co., Ltd.	CID002320
Tungsten	Hunan Chenzhou Mining Group Co., Ltd.	CID000766
Tungsten	Chenzhou Diamond Tungsten Products Co., Ltd.	CID002513
Tungsten	Japan New Metals Co., Ltd.	CID000825

Tungsten	Jiangxi Xincheng Tungsten Industry Co., Ltd.	CID002317
Tungsten	Fujian Jinxin Tungsten Co., Ltd.	CID000499
Tungsten	Jiangxi Richsea New Materials Co., Ltd.	CID002493
Tungsten	Tejing (Vietnam) Tungsten Co., Ltd.	CID001889
Tungsten	Wolfram Bergbau und Hütten AG	CID002044
Tungsten	Xinhai Rendan Shaoguan Tungsten Co., Ltd.	CID002095
Tungsten	Jiangxi Tonggu Non-ferrous Metallurgical & Chemical Co., Ltd.	CID002318
Tungsten	Ganzhou Huaxing Tungsten Products Co., Ltd.	CID000875
Tungsten	Chongyi Zhangyuan Tungsten Co., Ltd.	CID000258
Tungsten	Malipo Haiyu Tungsten Co., Ltd.	CID002319
Tungsten	Ganzhou Jiangwu Ferrotungsten Co., Ltd.	CID002315
Tungsten	Vietnam Youngsun Tungsten Industry Co., Ltd	CID002011
Tungsten	Dayu Weiliang Tungsten Co., Ltd.	CID000345
Tungsten	Nui Phao H.C. Starck Tungsten Chemicals Manufacturing LLC	CID002543
Tungsten	Hunan Chunchang Nonferrous Metals Co., Ltd.	CID000769
Tungsten	Xiamen Tungsten Co., Ltd.	CID002082
Tungsten	Jiangxi Gan Bei Tungsten Co., Ltd.	CID002321
Tungsten	H.C. Starck Smelting GmbH & Co.KG	CID002542
Tungsten	Global Tungsten & Powders Corp.	CID000568

1. Information based on CFSI Standard Smelter List as of March 10, 2015.
2. Specific smelters and refiners providing materials that end up in our products cannot be identified with certainty due to suppliers' company-level reporting. Our metrics reflect CFSI-compliant smelter and refiner information reported to us by our suppliers.

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# Conflict Minerals Industry and Cross-Industry Leadership Efforts

We have led the development and sharing of best practices on key supplier issues within our industry and other industries. For example, we have joined organizations and obtained leadership positions at relevant conflict minerals working groups and organizations.

Some of these memberships and leadership positions include the following:

- **Automotive Industry Action Group (AIAG)** – Ford is an active participant, leading efforts such as the Smelter Engagement Team and Best Practices team to develop processes and tools to educate suppliers and improve supply chain reporting transparency.
- **Conflict-Free Sourcing Initiative (CFSI)** – Ford is an active member, participating in cross-industry smelter outreach and pre-audit smelter visits to encourage smelter participation in the audit program.
- **Multi-Stakeholder Group (MSG)** – Ford participates in efforts to develop actions that can lead to improvement in the Congo and that can contribute to the development of efficient solutions to obtain conflict free materials from the Congo.
- **Public Private Alliance (PPA)** – Ford actively serves on the Governance Committee of the PPA to contribute to the development of in-region solutions for certified conflict free minerals.
- **International Material Data System (IMDS)** – Ford requests that our suppliers expose the use of tantalum, tin, tungsten and gold fully when reporting product content in the IMDS, and encourages other companies to adapt an aligned approach to IMDS reporting expectations.

### READ MORE:

[> Sustainable Materials Management](#)

External websites:

- [↗ Automotive Industry Action Group \(AIAG\)](#)
- [↗ Conflict-Free Sourcing Initiative \(CFSI\)](#)
- [↗ Multi-Stakeholder Group \(MSG\)](#)
- [↗ Public Private Alliance \(PPA\)](#)



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# Conflict Minerals Measurable Goals for the Future

As we continue on our conflict minerals journey, we have set the following measurable goals for the future:

- 100 percent response rate from in-scope suppliers for annual reporting
- Year-over-year improvement in the percent of suppliers providing smelter lists
- Year-over-year improvement in the percent of suppliers using Conflict-Free Sourcing Initiative (CFSI) compliant conflict free smelters
- Participate in CFSI Smelter Outreach efforts to identify smelters and encourage smelters to participate in the CFSI audit process

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# Supplier Diversity

Ford launched its Supplier Diversity Development program in 1978 with the goals of supporting minority- and women-owned businesses, creating business opportunities for diverse suppliers to grow into profitable enterprises, and further strengthening the Ford supplier network to reflect the company's workforce and customer base. Since that time, we have sourced more than \$80 billion in purchases from minority-, women- and veteran-owned businesses.

Ford remains strongly committed to working with and developing supplier companies owned by minorities, women and veterans. Our diverse suppliers are playing an important role in the company's revitalized and expanding portfolio of high-quality, safe, fuel-efficient products equipped with smart technologies. Our Supplier Diversity Development office works with business leaders, trade associations and community-based organizations that represent the interests of diverse businesses.

In 2014, Ford purchased \$6.75 billion in goods and services, or 13.3 percent of our total global spend, from approximately 200 minority-owned suppliers, and \$2.1 billion, or 3.4 percent of our global spend, from more than 150 women-owned businesses. We also purchased \$800 million in goods and services from veteran-owned companies. Our 2014 results represent the fifth-consecutive year of improvement and exceeded our sourcing goals for both minority- and women-owned suppliers.

Also in 2014, we were recognized 20 times for our Supplier Diversity Development Program – evidence we are doing well toward our stated goal to “maintain leadership in supplier diversity.”

## Major Awards and Recognitions for Supplier Diversity Program

1. Top Corporation for Women's Business Enterprises (third-consecutive year) – *Women's Business Enterprise National Council*
2. Corporation of the Year – *Center for Empowerment and Economic Development*
3. \$1+ Billion Spend (Tier 1 and Tier 2) with Hispanic Companies – *United States Hispanic Chamber of Commerce (only automotive OEM and one of five companies in the U.S. to be recognized at this top level)*
4. Best-in-Class award for Excellence in Supplier Diversity – *Women's Business Enterprise Council-Great Lakes*
5. Corporate ONE Award (fifth-consecutive year) – *Michigan Minority Supplier Development Council*
6. Corporation of the Year – *Michigan Hispanic Chamber of Commerce*
7. Top 100 Corporations of the Year – *Women's Enterprise (WE) USA*
8. Best of the Best list for Top Supplier Diversity Programs – *Hispanic Network Magazine*

9. America's Top Corporation for Women Business Enterprises – WE USA
10. Top 50 Organizations for Multicultural Business Opportunities – *DiversityBusiness.com*
11. Best Companies for Diversity – *Hispanic Business*
12. Top 2014 Supplier Diversity Companies List – *Hispanic Business*
13. 2014 Corporate 101: America's Most Admired Corporations for Supplier Diversity – *Minority Business News (MBN) USA*

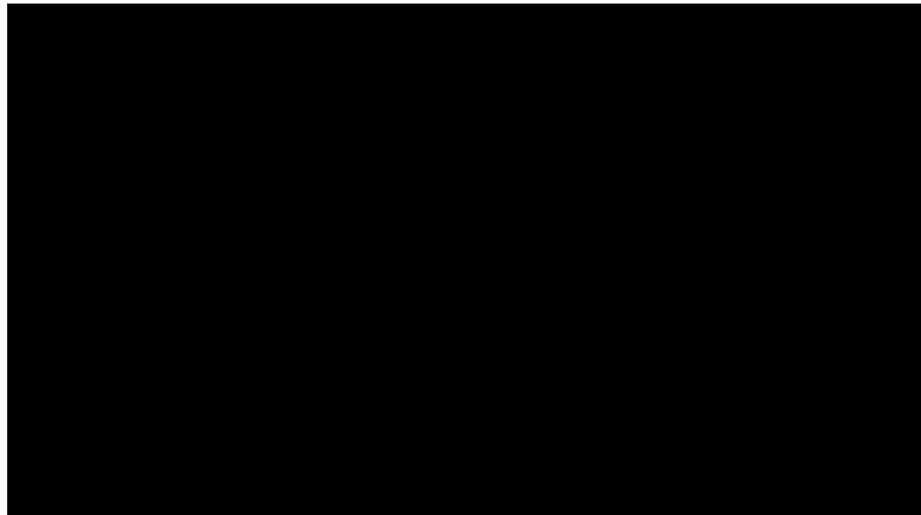
## Individual Awards for Ford Employees

1. Top 25 Women in Power Impacting Diversity (Marcella McCullough) – *DiversityPlus Magazine*
2. Top 100 Leaders in Corporate Supplier Diversity (Carla Traci Preston) – WE USA
3. Who's Who in Supplier Diversity Development (Hau Thai-Tang) – WE USA
4. Who's Who in Supplier Diversity Development (Carla Traci Preston) – WE USA
5. Who's Who in Supplier Diversity Development (Hau Thai-Tang) – *Minority Business News (MBN) USA*
6. Who's Who in Supplier Diversity Development (Carla Traci Preston) – MBN USA
7. Minority Supplier Development Leader of the Year (Carla Traci Preston) – *National Minority Supplier Development Council*
8. Advocate of Year (Carla Traci Preston) – *Michigan Hispanic Chamber of Commerce*

Our record of minority supplier development has also earned Ford a seat at the Billion Dollar Roundtable (BDR), an exclusive group of 19 companies that purchase a minimum of \$1 billion annually from diverse suppliers. The BDR encourages corporate entities to continue growing their supplier diversity programs by increasing commitment and spending levels each year.

Ford earned all of these awards for developing and driving innovative best practices across our organization that result in productive business partnerships with diverse entrepreneurs and valuable products and services for our customers.

*Learn more about supplier diversity at Ford:*



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# Logistics Operations

Ford's physical logistics operations provide the safe and efficient transport of parts from our suppliers to our manufacturing plants (our "inbound" freight) and of finished vehicles from the end of our assembly lines to our dealerships (our "outbound" freight).

This work is managed by Ford's Material Planning and Logistics (MP&L) organization, whose responsibilities include designing and operating our global transportation networks and engineering high-quality and efficient packaging to protect material in transit.

## Green Logistics

Within our MP&L organization, our environmental initiatives are known collectively as "green logistics." We focus our green logistics activities on three main areas:

1. Analyzing our networks and quantifying our freight greenhouse gas (GHG) emissions
2. Improving the efficiency of our operations to reduce those GHG emissions
3. Increasing the use of sustainable materials and processes within our packaging operations

Since freight emissions and fuel usage are so closely tied, our focus on emissions reduction also encourages actions that help us achieve other environmental goals, such as improving air quality and reducing traffic congestion.

Ford MP&L is a global organization, and its activities are coordinated within Ford's five operating regions (North America, South America, Europe, Middle East and Africa, and Asia Pacific). The standardization of practices and sharing of best practices across these regions are supported by a central green logistics website.

## Freight GHG Emissions Reporting

Understanding and quantifying our freight carbon dioxide (CO<sub>2</sub>) emissions is important for a number of reasons, including:

- Helping us to understand our overall environmental impacts
- Enabling us to prioritize actions to reduce emissions
- Allowing us to calculate the full carbon footprint of our supply chains
- Providing data for the overall life cycle carbon footprint of our vehicles
- Providing data to respond to customer inquiries

We began producing basic CO<sub>2</sub> metrics for our European inbound freight operations back in 2006, in conjunction with our European lead logistics provider. Following benchmarking on best practices, this work developed in to a full monthly report to cover European road

On this page:

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and rail freight emissions. In 2008 we established an international team to coordinate our reporting activities and have expanded our reporting to include transportation networks in North America, South Africa, India and Australia. We have also expanded our reporting to include additional modes of transportation such as ocean freight, using methods developed by our transatlantic lead logistics provider.

Our approach is to work closely with our lead logistics partners to gather comprehensive routing data and carry out calculations based on best available emissions factors and fuel efficiency numbers. Data from different regions is collated in our global performance scorecard, which is regularly reviewed by senior management.

We continually update our reporting methods to follow evolving international best practices. For example, we now use factors that account for other GHGs, such as nitrous oxide and methane, in addition to CO<sub>2</sub>. We are moving now toward calculating “well-to-wheels” emissions, to include the CO<sub>2</sub> produced during the mining, refining and transport of fuel in addition to the CO<sub>2</sub> from combustion of the fuel. This approach allows a better understanding of the overall benefits of using different fuel sources and of switching to renewable energy sources for electricity.

Tracking transport emissions allows us to study the impacts of different sourcing patterns. Our MP&L function is working closely with Purchasing on value stream mapping projects to help us compare the transportation and manufacturing footprints in different source locations.

We are taking an active role in the development of new reporting processes for automotive freight emissions. In 2011, we were a road-tester of the World Resource Institute and the World Business Council for Sustainable Development’s new Greenhouse Gas Protocol Scope 3 reporting standards, which cover freight CO<sub>2</sub> reporting. We have since worked with the Automotive Industry Action Group (AIAG) in North America to encourage others in the industry to adopt these standards and help to provide relevant training. In Europe, we were part of the U.K. Department for Transport’s Low Carbon Transport Supply Chain Steering Group, which published Guidance on Measuring and Reporting Greenhouse Gas Emissions. In Asia, we participated in the inaugural Green Freight China seminar in Beijing, run jointly by Clean Air Asia and the Chinese government.

Most recently we led a project with Odette International, the European automotive supply chain standards organization, to publish new GHG reporting guidelines. These guidelines provide support on best practices and include information on using the new European Committee for Standardization CEN European reporting standard.

We believe it is important for our logistics providers to have their own policies on CO<sub>2</sub> issues. Since 2011, we have involved our major North American and European logistics service providers in our annual Carbon Disclosure Project Supply Chain Survey as part of our effort to encourage them to have strategies to improve the sustainability of their operations. In 2014, we worked closely with our French carriers to help them fulfill their obligations under the recently published French government mandatory freight transport emissions reporting legislation.

Also see:

> [Environmental Sustainability in Our Supply Chain](#)

## Freight Emissions Reduction

Freight emissions are influenced by a wide range of factors, including the mode of freight (road, rail, sea, etc.); the efficiency of the vehicles, barges and other equipment that is used to move parts and products; and the design of the freight network and the packaging we use. The graphic below highlights the complexity of factors influencing freight-related

emissions.

Influences on Freight CO <sub>2</sub> Emissions		
FREIGHT MODE	NETWORK DESIGN	PACKAGING
<ul style="list-style-type: none"><li>• Road</li><li>• Rail</li><li>• Barge/Short Sea</li><li>• Ocean</li></ul>	<ul style="list-style-type: none"><li>• Network Planning</li><li>• Location of Hubs</li><li>• Utilization</li></ul>	<ul style="list-style-type: none"><li>• Materials</li><li>• Pack Density</li><li>• Empties Management</li></ul>
EQUIPMENT	FACILITIES	MISCELLANEOUS
<ul style="list-style-type: none"><li>• Engine Design</li><li>• Fuel Type</li><li>• Trailer Design<sup>1</sup></li><li>• Operating Practices</li><li>• Driving Skills</li></ul>	<ul style="list-style-type: none"><li>• Building Design</li><li>• Energy Sources</li><li>• Energy Conservation</li><li>• Operating Practices</li></ul>	<ul style="list-style-type: none"><li>• Launch Support</li><li>• Contingency Actions</li><li>• Emergency Air Freight</li></ul>

The most effective leverage points in this system in terms of reducing emissions are:

- Improving the design and operation of our transportation
- Increasing the use of greener modes of transport (such as rail and water)
- Reducing miles traveled
- Increasing vehicle utilization

In general, we contract and manage our own freight networks rather than have freight contracted by our suppliers. This gives us better control and allows us to optimize collections and deliveries across all pickup points and destinations, minimizing the total amount of transport required.

Our freight emissions-reduction efforts generally focus on reducing the number of vehicle miles traveled to deliver our inbound parts and outbound vehicles, as well as improving route efficiencies and switching to lower-emission transport methods. Some of the specific strategies we use to reduce freight emissions include:

- Using regional distribution centers to coordinate deliveries and reduce the number of vehicles collecting materials from suppliers that are destined for multiple factories
- Using “milk run” routes, where groups of collection points can be visited by a single truck, to minimize the number and length of journeys required
- Developing contracts with our freight providers that encourage them to carry third-party freight on return journeys rather than returning home empty, which not only gives us a cost benefit but reduces overall traffic on the roads
- Maximizing the use of lower-emission transport modes such as rail, river and short sea transport, instead of road transport. It has been estimated that switching from road to rail can reduce CO<sub>2</sub> emissions by 40 percent as well as reducing road congestion
- Using “SWAP bodies” – standard freight rail containers that can be lifted onto dedicated road trailers – to expand our ability to use rail freight where possible on a given journey and road transport as needed
- Improving packaging to allow us to carry more cargo in fewer trips

- Improving load density, or the number of finished vehicles carried per conveyance, which lowers the number of conveyances employed and reduces the amount of fuel consumed
- Improving the fuel efficiency of our transportation fleet by using the latest engine technologies, improving vehicle aerodynamics and training drivers on more fuel-efficient driving practices

Where we have in-house transport fleets, we are able to monitor fuel economy and take specific actions to improve efficiencies. In Europe, our Transport Operations group has introduced technical solutions such as speed limiters and air deflectors, as well as carrying out extensive driver training on safe and efficient driving. At our Rawsonville plant, the Ford-owned transport fleet is accredited to the U.S. Environmental Protection Agency's SmartWay program for using best practices in tractor technologies and driver training.

The following projects undertaken by our global MP&L teams help to illustrate the range of activities involved in reducing our freight emissions:

- At the Kentucky Truck Plant we made routing improvements for the distribution of vehicles to the U.S. West Coast, resulting in an annual reduction of 2.5 million rail miles.
- We improved the load ratio of Ford F-150 trucks that are loaded on railcars from the Dearborn Truck, Melvindale, New Boston and Kansas City Assembly Plants, reducing our railcar requirement by more than 100 railcars and 85,000 rail miles annually.
- The new Ford Transit van manufactured at our Kansas City Assembly Plant is too tall for standard two-tier rail wagons. We developed modified wagons to allow them to fit, thereby avoiding having to ship them by road.
- At the Cuautitlán Assembly Plant in Mexico we implemented short sea moves as part of a multi-modal distribution network, eliminating the need to transport 20,000 vehicles annually by rail from Cuautitlán to the U.S. East Coast.
- In our Asia Pacific region, we implemented projects in 2014 to increase the use of rail freight in lieu of road, to save a significant number of truck movements each year.
- In India, rail transportation was introduced in August 2014 for the distribution of finished vehicles from our Chennai Plant and is to be implemented for shipments from our Sanand Plant during 2015. Trials are progressing to use the same rail system for inbound production material shipments.
- Ford India is working with other manufacturers on an initiative with the government of India and shipping lines to investigate the use of coastal shipping for moving vehicles from plants in Chennai region to Western India.



*Example of use of double-deck rail wagons for shipment of vehicles by Ford India*

## 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 has environmental impacts throughout its life cycle, including materials usage,

transportation 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 of parts to our St. Petersburg, Russia, plant so it is able to use returnable packaging. We are also introducing returnable steel racks for many of our new transatlantic shipments that previously would have been shipped in disposable material.

We are working closely with packaging suppliers to take advantage of new developments. In Spain, for example, we are introducing dedicated designs that include foldable internal packaging that avoids the need for disposable material. The foldable packaging is also lighter and easier to handle than conventional standardized returnable packaging.

The European powertrain packaging team is introducing a novel approach to packaging returns. The empty packaging is broken down into small chips that are then returned in sacks to be remade into new packaging close to the original supplier location. This dramatically reduces the volume of the return shipments, and thereby also reduces transportation costs and emissions.

An example from our Asia Pacific region is their implementation of returnable packaging for hazardous material shipments, such as of air bags from Europe to China. Previously this part had been handled by air shipment, but now it can be shipped by sea, providing considerable emissions savings.

The biggest challenge in sustainable packaging has been long-distance ocean freight. Traditionally, the majority of automotive parts shipped by sea are packed in cardboard. The cardboard boxes are recyclable and are of modular design to optimize their utilization. As our global programs increase, however, we are working to reduce this dependence on cardboard through a new initiative to use IsoBins – a durable container that has been specially designed for use in sea containers. A pool of IsoBins is managed by a third party on behalf of Ford, and the bins can be used for shipping different materials back and forth on each journey, thus eliminating cardboard and minimizing the transportation of empty containers.



We are now working globally to share best practices between regions and drive

consistency in packaging for future global vehicle programs. Ford's latest packaging guidelines 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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1. Including aerodynamics, tires, oils, etc.

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# Data

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- E. [Total Purchases from Veteran-owned Businesses – United States](#)

## A. Working Conditions Training and Assessment Status for Supply Chain

Working Conditions Assessments (as of 12/31/14)	Americas	Asia Pacific <sup>1</sup>	Europe	Middle East & Africa <sup>1</sup>	<b>Global Total</b>
Average violations per assessment	10.9	11.8	12	5.7	<b>11.2</b>
Assessments completed to date	362	480	102	46	<b>990</b>
Follow-up assessments completed to date (third party and/or internal)	433	505	123	52	<b>1,113</b>

Working Conditions Training (as of 12/31/14) <sup>2</sup>	Americas	Asia Pacific <sup>1</sup>	Europe	Middle East & Africa <sup>1</sup>	<b>Global Total</b>
Training sessions conducted to date <sup>2</sup>	70	49	24	6	<b>149</b>
Total number of attending companies	968	836	363	87	<b>2,254</b>
Total number of trained managers (attendees)	1,517	1,026	634	133	<b>3,310</b>

Working Conditions Training (Scope of Impact: Supplier-Submitted Data as of 12/31/14)	<b>Global Total</b>
Training cascade to management, individuals trained	<b>25,789</b>
Training cascade to workforce, individuals trained	<b>559,755</b>
Communication to suppliers, number of sub-tier companies	<b>115,780</b>

Data notes and analysis:

1. In 2014, we reorganized our operations into five regional business units: Asia Pacific, Europe, North America, South America, and Middle East & Africa. Data for Asia Pacific has been restated for all years to remove Middle East and Africa data, which is now being provided separately.
2. In 2014, the training and assessment data was been updated to reflect a consistent calculation

methodology. Data prior to 2014, have also been updated to reflect this calculation methodology.

Also see:

[> Human Rights and Working Conditions in Our Supply Chain](#)

## B. Total Supplier Sites Trained/Retrained in Sustainability Management

Cumulative, since 2005

2012	2013	2014
2,437	2,670	2,948

Data notes and analysis:

This is a new indicator that was calculated for the years shown, 2012 through 2014.

Also see:

[> Industry Collaboration](#)

## C. Total Purchases from Minority-owned Businesses – United States

\$ billion

2009	2010	2011	2012	2013	2014
2.7	3.8	5.1	5.7	6.5	6.8

Data notes and analysis:

In 2014, Ford purchased \$6.75 billion in goods and services, or 13.3 percent of our total global spend, from approximately 200 minority-owned suppliers. Our 2014 results represent the fifth consecutive year of improvement and exceeded our sourcing goals for minority-owned suppliers.

Also see:

[> Supplier Diversity](#)

## D. Total Purchases from Women-owned Businesses – United States

\$ billion

2009	2010	2011	2012	2013	2014
0.539	0.866	1.06	1.2	1.8	2.1

Data notes and analysis:

In 2014, Ford purchased \$2.1 billion, or 3.4 percent of our global spend, from more than 150 women-owned businesses. Our 2014 results represent the fifth consecutive year of improvement and exceeded our sourcing goals for women-owned suppliers.

Also see:

[> Supplier Diversity](#)

## E. Total Purchases from Veteran-owned Businesses – United States

\$ million

2012	2013	2014
450	590	858

Data notes and analysis:

In 2014, we began reporting purchases from veteran-owned businesses. Prior year data is only available for 2012 and 2013.

Also see:

[> Supplier Diversity](#)

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**Communities**

Engaging with and investing in communities is more than the right thing to do; it's also smart business. Our global company is only as strong as the local communities in which our employees and customers live and work.

**Communities**

Community Engagement and Investment

The Ford Motor Company Fund and Community Services

Ford Volunteer Corps

Dealers in Our Communities

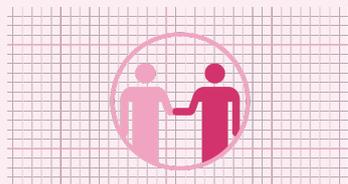
Ford Motor Credit Company's Community Investments

Building a Better World: Ford's Community Projects Around the World

Assessing the Larger Benefits of Our Community Engagement

Data

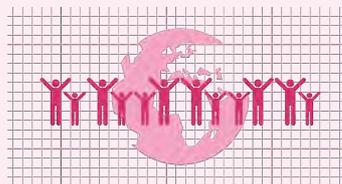
Case Study: Engaging With Our Communities on Water



**Locally Tailored Approach**

As we increase our operations in emerging economies, we find new community issues to understand and manage.

> [Community Engagement and Investment](#)



**Expanding Globally**

As Ford expands, we are also expanding our community investment and volunteering efforts.

> [The Ford Motor Company Fund and Community Services](#)



**Building a Better World**

Our investments focus on improving community life, including hunger relief, water issues, human rights, education and driver safety.

> [Building a Better World: Ford's Community Projects Around the World](#)

**LOCALLY TAILORED APPROACH**

Across the globe, we seek community investments that meet local needs, have a measurable impact and, where possible, can be replicated in other

markets.

> Community Engagement and Investment



**\$45.6 million**  
in Ford contributions  
to community  
activities in 2014.  
That's over \$8 million  
more than in 2013.

EXPANDING GLOBALLY

In 2014, we continued to expand our global reach through Ford's Operation Better World, a coordinated, strategic approach to how Ford engages with communities everywhere that we do business.

> The Ford Motor Company Fund and Community Services

BUILDING A BETTER WORLD

Some 30,000 Ford employees and retirees in 41 countries provided more than 160,000 volunteer hours on 1,600 community service projects – the equivalent of \$3.5 million of in-kind corporate contributions.



> Building a Better World: Ford's  
Community Projects Around the  
World

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# Community Engagement and Investment

Engaging with and investing in communities is more than the right thing to do; it's also smart business. Our global company is only as strong as the local communities in which our employees and customers live and work, so it is in our mutual interest that we work with communities to make meaningful contributions to improve quality of life.

For us, it is not just about donating money. It's also about building partnerships and working with others to address the difficult challenges so many people are facing.

Our community support is aligned with our company goals and our One Ford plan. One of the key elements of One Ford is to build a better world, and so reaching out and providing assistance to our communities is an essential part of what we do.

In recent years, we have taken steps to develop a more integrated approach to managing the different dimensions of our community involvement. Our goal is to more closely connect our community relations programs, our community impact assessment processes and our key sustainability and business priorities such as human rights, access to water and driving safety. We also focus on helping communities meet basic needs (such as food and shelter), supporting development programs, aiding with emergency and disaster response, and assisting in improving educational opportunities.

*We are developing a more integrated approach to managing the different dimensions of our community involvement.*

## Expanding Globally, Engaging Locally

Whether doing business in Michigan or Malaysia, we seek to respect and make a positive contribution to our host communities. As we expand our operations in emerging economies, however, we're finding new community issues to understand and manage.

One of these issues is human rights. Specifically, we must ensure that our products, no matter where they are made, are manufactured under conditions that demonstrate respect for the people who make them. We also must respect the rights of people living in the communities around our facilities, as well as our suppliers' facilities, who may be affected by those operations. We view respect for human rights not only as a core operational issue, but also a key to maintaining the trust and respect of local communities. For more information on [how we manage human rights issues in our own operations](#) see the Governance section; for information on how we address human rights in our supply chain, see the [Supply Chain](#) section.

*Human rights and water are two new community issues that we need to understand and manage.*

As we expand into new markets in more water-stressed regions, we are also expanding our engagement with local communities on water issues. We have developed a comprehensive water strategy based on both environmental and social risks and opportunities in local communities where we operate. Over time, we also want to link all of these efforts with our development of new products and services to meet the unique mobility needs of communities in emerging markets. See the Mobility section for more on this topic.

Also see:

- > [Case Study: Engaging With Our Communities on Water](#)
- > [Water](#)
- > [Mobility](#)

## Investing Locally across the Globe

As our business expands globally, we are also expanding all of our community investment and volunteering efforts internationally. We invest in communities in three primary ways: through direct corporate charitable giving; through our company's community investment arm, the Ford Fund (formally known as [Ford Motor Company Fund and Community Services](#)); and through the [Ford Volunteer Corps](#), which organizes the volunteering efforts of thousands of Ford employees and retirees across our global operations. Our [dealer network](#) and [Ford Motor Credit Company](#) also make significant investments in their communities.

In 2014, we continued to expand our global reach through Ford's Operation Better World, a coordinated, strategic approach to how Ford engages with communities everywhere that we do business. The Ford Fund launched this program in 2012 in three markets outside the U.S. By 2015, the program expanded to reach 39 markets around the world. Through Operation Better World, the Ford Fund seeks to drive sustainable community innovation by making strategic investments in four areas: education, auto safety, community needs and sustainability (with a focus on water). The [Ford Fund](#) works to ensure that Operation Better World investments meet local community needs, align with the One Ford business plan, have a measurable impact and, where possible, can be replicated in other markets. This grassroots engagement in the community is implemented and led by the local Ford teams in each region.

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In 2014, Ford contributed

**\$45.6**  
million

to community activities (over \$8 million more than in 2013).

Of that amount, \$30.2 million was in the form of grants awarded by the Ford Fund; the remainder was direct corporate giving.

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# The Ford Motor Company Fund and Community Services

The Ford Motor Company Fund and Community Services (or “the Ford Fund”) is a nonprofit organization responsible for the company’s philanthropic investments and volunteer efforts.<sup>1</sup>

It is funded by contributions from Ford Motor Company. The goals of the Ford Fund today are the same as they were when Henry Ford II founded it 65 years ago: to support programs that effect meaningful change and improve the quality of life in the communities in which Ford does business.

We organize our community investment activities around our three strategic priorities: community life, education and driver safety. We developed these priorities to focus our efforts and intensify the benefits of our community investments. We also seek ways to help that will make the most of our financial contributions, as well as the unique skills of our company and employees. In 2014, we also continued to increase our focus on water-related projects in support of Ford’s overall [water strategy](#).

*Our three key community investment priorities: community life, education, driver safety.*

**READ MORE:**

*Read more about our community projects around the globe*

> [Building a Better World: Ford's Community Projects Around the World](#)

1. The Ford Foundation, incidentally, is a separate entity from Ford Motor Company and the Ford Fund. No member of the Ford family nor Ford Motor Company management is on the Ford Foundation Board of Trustees.

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# Ford Volunteer Corps

Volunteerism has been an integral part of Ford Motor Company since its creation in 1903. We encourage our employees to participate in programs that build stronger communities through the Ford Volunteer Corps.

The Volunteer Corps operates across six continents to strengthen the communities in which our employees and customers live and work. We started the Corps in 2005 for salaried workers. We are in the process of expanding it to include Ford's UAW<sup>1</sup>-represented workforce, adding another avenue for these employees who already have a long tradition of volunteering through other channels.

Ford Motor Company offers its salaried employees two paid workdays per year to volunteer in the community. We help to maximize the effectiveness of our volunteering efforts and facilitate employee volunteering through a "volunteer matchmaking" software system designed and launched by the Ford Volunteer Corps. Through this system, our nonprofit partners can tell us when they need help and what help they need most, and employees can sign up online for volunteer opportunities based on their interests and availability. We are continuing to expand the system to strengthen data-collection capabilities – especially in our non-U.S. operating regions – and to enhance the employee user experience. The Ford Volunteer Corps sponsors activities all year, and around the globe. However, we also seek to focus our efforts through two intense volunteer programs: Ford's Global Week of Caring and our four annual Accelerated Action Days.

## Global Week of Caring

Ford's Global Week of Caring is one of the cornerstone programs of the Ford Volunteer Corps. It includes a week of volunteer events across all of Ford's operating regions. In 2014, our ninth year with this program, more than 15,000 Ford employee and retiree volunteers participated in more than 320 projects in 36 countries and 17 U.S. states.

The Ford Fund provides "mini-grants" to help fund supplies needed by volunteers to complete their projects. As part of our efforts to expand our community investments as we expand our global operations, we have increased the amount we give in these supporting mini-grants and the locations in which we give them. We started the supporting mini-grants program in 2012 in Asia Pacific. Since then we have expanded mini-grants to Europe, South America, Mexico and the Middle East. We will expand them to sub-Saharan Africa in 2015. In 2014, Ford contributed \$400,000 in mini-grants to support Global Week of Caring projects, \$85,000 – or 27 percent – more than in 2013.

During 2014, some 30,000 Ford employees and retirees in 41 countries provided more than 160,000 hours of work on more than 1,600 community service projects – the equivalent of

# \$3.5 million

of in-kind corporate contributions.

Many of these volunteer projects received mini-grants from the Ford Fund to help complete the projects.

*We have increased the amount we give in mini-grants and the locations in which we give them.*

This year's Global Week of Caring put a special emphasis on projects that support and protect water resources, in support of Ford's overall [water strategy](#). Next year will be the 10th anniversary of the Global Week of Caring. We are planning to expand the program significantly for 2015 as part of our 10-year celebration.

## Accelerated Action Days

Accelerated Action Days (AAD), another key program of the Ford Volunteer Corps, are concentrated, one-day volunteer efforts to meet critical needs identified by our nonprofit partners. In 2014, we held four Accelerated Action Days that included more than 2,500 Ford volunteers in 12 states and approximately \$240,000 in donations to support their projects. Our 2014 Accelerated Action Days focused on hunger relief, children and families, environment and community building, and food and security.

### READ MORE:

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*Read more about our community projects around the globe*

- > [Building a Better World: Ford's Community Projects Around the World](#)

- 
1. UAW originally stood for United Auto Workers; the full name today is the International Union, United Automobile, Aerospace and Agricultural Implement Workers of America.

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# Dealers in Our Communities

Ford and Lincoln dealers play an important part in Ford's community engagement and investments. They represent the face of Ford in our communities and provide important economic and social contributions well beyond their roles as employers and taxpayers.

Ford annually recognizes dealers' outstanding contributions to their communities through our "Salute to Dealers" program. The program was established in 2001 to demonstrate our commitment to dealers who provide outstanding products and services and improve the lives of those in need. These remarkable honorees and nominees are selected from a field of thousands of Ford and Lincoln dealers across the globe.

Ford is very proud of the contributions made by the dealers who are nominated for this award and the 100 men and women who have been selected as Salute to Dealers honorees since the program's inception. Considering the high quality and community spirit of our dealer body, this is a tribute to their hard work and dedication to make the world a better place.

Our 2015 awards recognized the following dealer principals for their unparalleled generosity and commitment to their communities:

## Helping those devastated by typhoon

**Andre Rafael R. Borromeo, Ford Tacloban**  
Tacloban City, Philippines

Through the years, Andre Rafael Borromeo has positively affected countless lives through his humanitarian and charitable efforts and his participation in community development projects. When a major typhoon hit Tacloban in 2013 and destroyed his dealership, Borromeo and his staff provided transportation, food, clothing and shelter to those who had lost their homes. He secured vehicles to transport victims to safe locations and supported a group of foreign volunteers by sending additional manpower to assist their medical mission. He also established a new local water system and a vocational school for the deaf, and he annually provides university scholarships to local students.

## Raising funds for charitable causes

**Robert Elder, Elder Ford of Tampa**  
Tampa, Florida, United States

Robert Elder has a deep-rooted commitment to his community as witnessed by his leadership roles in numerous charitable organizations and causes. In an effort to fight childhood obesity through physical activities, Elder cofounded the Replay

Tampa Bay charity with the Tampa Bay Sports Commission, to provide children with sporting goods in lieu of toys at Christmas. As a result, thousands of bicycles and other items have been donated annually. Elder also raises funds for wounded military personnel and veterans, benefiting the Green Beret Foundation, the Foundation for Exceptional Warriors and local veteran charities.

## Rebuilding a community struck by earthquake

**Nas Khan, Jennings Ford Middlesbrough**  
Middlesbrough, United Kingdom

Nas Khan has devoted much of his career to spearheading projects and supporting charities and nonprofits that improve the lives of others. When a major earthquake hit the Kashmir area and subsequent floods devastated Pakistan, where Nas is originally from, he began raising funds for improvement, which evolved into an initiative for building a new village for flood victims. The village includes 60 completed homes, wells that provide clean drinking water, and livestock to help rebuild and sustain the community.

## Working for health, safety and education

**Ronald F. Kody, Richmond Ford Lincoln**  
Richmond, Virginia, United States

Ronald Kody is actively involved with a wide variety of causes in the greater Richmond area representing health, safety and education. In addition to being the annual title sponsor for the Susan G. Komen Race for the Cure, his dealership hosts the annual St. Jude Children's Research Hospital Radiothon. Kody and his staff open their store six weeks prior to the event each year, with fundraising, test drives and other promotional activities offered.

## Empowering volunteers to make a difference

**Gary L. Uftring, Uftring Ford**  
East Peoria, Illinois, United States

Gary Uftring's commitment to giving back to his community is exemplified by The Uftring Ambassadors, an initiative that empowers dealership employees to donate and become personally involved with helping many different organizations across their community. In addition to participating in many walks, food drives and charitable donations, last fall Uftring and his ambassadors addressed the devastation caused by a major tornado that ravaged the area. They repaired flat tires for local families and loaned vehicles at no charge for several weeks after the storm. Team members also volunteered countless hours helping families affected by the tornado to clean and repair their homes.

## Responding to need in impoverished communities

**Miguel Zapata, Ford Zapata**  
Tlalnepantla, Mexico

Miguel Zapata and his entire family have a deep and ongoing commitment to improving the health and welfare of those in need in their community. In addition to funding a 5,000-patient rural clinic each summer, they are devoted to Proyecto Niño

– a far-reaching charity begun by Zapata’s father and the Rotarian organization. Over the years, the program has expanded to meet a wide spectrum of needs in impoverished communities, providing help to infants, children, adults, seniors and even pets.

**READ MORE:**

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> [Working with Ford – Dealers](#)

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# Ford Motor Credit Company's Community Investments

Ford Motor Credit Company, or "Ford Credit," is a wholly owned subsidiary of Ford Motor Company that offers automotive financial services to dealerships and customers around the world.

Ford Credit has a long-standing commitment to the communities in which it does business. This includes providing structured work experience programs for young people. Ford Credit employees also participate in numerous community activities globally. Examples include:

- Environmental projects such as waterway cleanup, park and school beautification and recycling
- JDRF walks to benefit diabetes research
- The Susan G. Komen Race for the Cure and other activities benefiting medical research or assistance organizations
- Drives to collect items such as supplies for schools, food for the hungry, clothing for the needy and necessities for soldiers stationed far from home

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# Building a Better World: Ford's Community Projects Around the World



We organize our community investment activities around our three strategic priorities: community life, education and driver safety.



↓ **Community Life**

Helping to strengthen the communities in which we operate is a core priority for Ford. Our efforts to improve community life include hunger relief, poverty alleviation, and environmental initiatives like water conservation.

↓ **Education**

We work with communities around the world to drive sustainable innovation in education.

↓ **Driving Safety**

The Ford Driving Skills for Life (Ford DSFL) program is the centerpiece of our efforts to improve driver safety.



## Community Life

Helping to strengthen the communities in which we operate is a core priority for Ford – and has been since Henry Ford started the company more than 100 years ago. We work closely with communities to understand what their needs are and how we can contribute to improving community life. This is by far the broadest of our strategic priorities and includes efforts focused on hunger relief and poverty alleviation, community infrastructure improvements, and support for elderly, disabled and other under-served populations. Community life also includes our investments in environmental initiatives and efforts to improve water conservation and access to clean drinking water.

*Highlighted projects:*

### Improving Access to Clean Water across our Global Communities

#### Multiple Countries

As part of our corporate [water strategy](#), we are increasing our engagement with local communities on water issues. In 2014, many of our Global Week of Caring (GWC) projects focused on increasing access to clean water in communities near our operations. Approximately 35 percent of our GWC projects addressed water-quality or water-access issues.

Also see:

> [Case Study: Engaging With Our Communities on Water](#)



### Fighting Hunger in Food Insecure Communities across the Nation

#### United States

We have been working to fight hunger in the U.S. for many years. In 2014, we put a special focus on this topic, donating more than \$1.3 million to strategic hunger relief programs across the country. A centerpiece of these efforts is our continued support of a national Ford Mobile Food Pantry Network, which we began building in 2010. Since then, we have donated 50 Ford Transit vans and joined with more than 30 nonprofit community service providers to distribute food to people in need. In 2014, 1.4 million meals were delivered through this network, and 5.5 million meals have been distributed by our nonprofit partners since this program began in 2010.

### Continuing a Long History of Support for Disabled American Veterans

#### United States

Ford has a long history of working with the Disabled American Veterans (DAV) organization. Ford is a major contributor to the DAV's Jesse Brown Memorial Youth Scholarship Program, for example, including funding scholarships to students who volunteer at local Veterans Administration medical centers. And for over a

decade, Ford has been a sponsor of the National Disabled Veterans Winter Sports Clinic, which allows hundreds of disabled veterans to go the mountains of Colorado to participate in adaptive winter sports. In 2014, we donated funds for the DAV to purchase seven new vehicles for its headquarters and the DAV Transportation Network, in addition to providing \$45,000 to the scholarship program.

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## Fighting Breast Cancer for More Than Two Decades

 *United States*

Ford has been a long-time supporter in the fight against breast cancer. For 21 years, Ford has been a National Race Series sponsor of the Susan G. Komen Race for the Cure® and has dedicated more than \$128 million to the cause in donations and in-kind gifts. Ford's commitment goes well beyond the October race; it lasts 365 days a year and focuses on raising awareness, support and donations for this cause, including apparel that is sold on [fordcares.com](http://fordcares.com). This specially designed Warriors in Pink® clothing and accessory line is dedicated to those fighting this disease, and 100 percent of net proceeds go to one of four breast cancer charities. Since 2006, we generated more than \$5.6 million from apparel sales for the cause. In addition, more than 77,000 Ford employees and thousands of dealership employees have been involved in races and supporting the cause in their local communities. We also introduced 20 survivors as part of our Models of Courage program. Their inspirational stories can be found on [fordcares.com](http://fordcares.com).

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## More Than 30 Years Supporting the American Red Cross

 *United States*

Ford has supported the American Red Cross mission for more than 30 years. Over the last five years, the Ford Fund and Ford Motor Company have contributed more than \$3 million to support the American Red Cross. We serve as a highly engaged partner that provides assistance to all five lines of service within the Red Cross mission: Disaster Relief, Health and Safety Training and Education, Service to Military Families, International Relief, and Lifesaving Blood.

As a member of the American Red Cross Disaster Responder program, Ford pledges support in advance of major disasters, ensuring that the Red Cross is adequately prepared for an immediate response to disasters of all sizes. In addition, we provide funding for emergency preparedness, youth education programs and vehicle donations.

---

## Record Donation to Fight Multiple Sclerosis

 *United States*

Ford volunteers, with the help of Ford's Group Vice President of Product Development Raj Nair, raised \$803,531 for the National Multiple Sclerosis Society's Michigan Chapter in 2014. This was an historic amount for Ford employees and exceeded their 2013 donation by more than \$423,500. We were also named the number one corporate sponsor in Michigan for the seventh year in a row and were recognized with the Circle of Distinction award from the organization.

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## Supporting the March of Dimes for More Than a Decade

 *United States*

In 2014, Ford volunteers raised more than \$550,000 for the March of Dimes. Ford Vice President Bruce Hettle and UAW Vice President Jimmy Settles served as UAW/Ford sponsors for the 2014 March for Babies campaign. Over the past 10 years, the UAW/Ford team has raised more than \$4 million for this cause.

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## Aiding the Fight against Type 1 Diabetes for More Than 20 years

 *United States*

For more than 20 years, Ford has been involved in helping find a cure for type 1 diabetes. We are the largest global sponsor of JDRF, the leading global organization focused on type 1 diabetes research. Ford employees organize and participate in a wide range of fundraising activities each year, and we raise funds through corporate initiatives such as vehicle auctions. All told, we have raised more than \$40 million for JDRF.

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## Recycled 75,000 Pounds of E-Waste

📍 *United States*

As part of our Accelerated Action Day program, Ford employee volunteers processed 75,000 pounds of electronic waste (e-waste) during the eighth-annual Ford Green IT eWaste event in Dearborn, Michigan. Almost 900 Ford employees came through the convenient drive-through recycling lanes, where fellow Ford employee volunteers unloaded electronic waste from their vehicles, sorted the devices, and stacked and prepared them for easy transport to specialty recycling centers. At the end of the day, 27,000 pounds of TVs, 16,000 pounds of CPUs and 12,000 pounds of CRT monitors were sent to be safely recycled. Recycling e-waste keeps hazardous metals such as lead, mercury and nickel out of local landfills and away from the water supply.



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## Converting Shipping Containers to Homes for Families

📍 *South Africa*

As part of the 2014 Global Week of Caring, 350 Ford volunteers in South Africa donated more than 2,800 hours to renovate and convert shipping containers into housing for 10 families in Booyens Park within the Vastrap Community, an area where many families lack access to formal housing, sanitation, water and electricity. The homes were given to elderly and/or disabled community member and families with small children.



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## Supporting Community Service Providers

📍 *South Africa*

As part of the 2014 Global Week of Caring, more than 100 Ford volunteers spent more than 750 hours helping local community service providers in South Africa. For example, 20 volunteers helped refurbish the Twinkle Twinkle Little Star Care Home, which provides a safe haven for abandoned, AIDS-infected children and orphans, and offers daycare to the surrounding community. Volunteers completed extensive repairs to the existing buildings and installed a shipping container that was converted into a play and learning facility.



At the Fundai Educare Center, another 20 volunteers made a wide range of repairs to the facility, including adding insulation and fixing broken plumbing and toilets, electrical points and wiring. They also replanted the vegetable garden, an important food source for the center. Volunteers installed a rainwater tank system to provide water for toilets and the vegetable garden. And, a converted shipping container was installed as a classroom.

Another 20 volunteers improved the facilities at the Lingeletu soup kitchen, which feeds up to 300 people

each week. Local residents volunteer their time to prepare the food; however, they have been challenged by limited space and amenities. Volunteers installed a shipping container that enlarged and improved their current kitchen facility.

Approximately 30 Ford volunteers also collected, purchased and donated food for Jeanny's Soup Kitchen, which has operated three soup kitchens across Port Elizabeth for 15 years. The organization provides soup, bread and half an orange each day to more than 1,000 people.

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## Supporting a Center for the Disabled

### 📍 *Spain*

As part of our 2014 Global Week of Caring, 10 Ford volunteers in Spain spent 80 hours working with nuns at the Cottolengo Del Padre Alegre center, which provides free housing and assistance to approximately 100 mentally and physically handicapped women of all ages. Ford volunteers helped with building maintenance, donated food and supplies, and took time to socialize and interact with the residents. This center does not receive government assistance and is solely supported by donations. Ford employees volunteer at the center regularly.



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## Improving Medical Care Opportunities in the Coraivia Community

### 📍 *Romania*

As part of the Global Week of Caring, Ford employees in Coraivia, Romania, partnered with the nonprofit organization OncoHope on two projects. One project improved infrastructure and refurbished facilities at the state hospital, to improve living conditions for sick children. This work included buying construction materials and hospital furniture and painting the walls, among other refurbishing activities. In the second project, Ford employees provided financial aid for medical tests and investigations for community members and organized recreation activities for children with cancer.



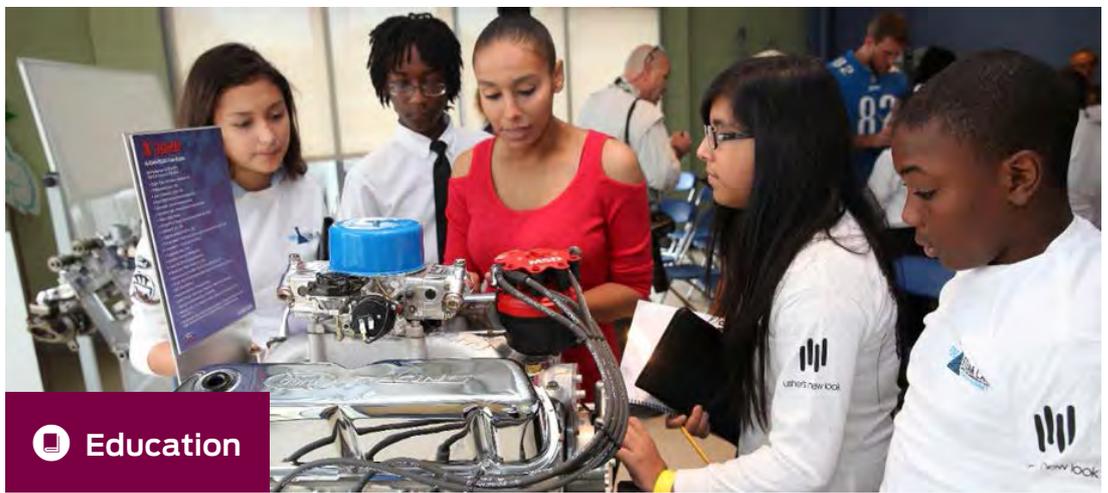
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## Expanding Our Conservation and Environmental Grants Program

### 📍 *Asia Pacific*

We are continuing to expand our Conservation & Environmental Grants (CEG) program, the company's flagship philanthropic program in China focused on supporting grassroots environmental/sustainability nongovernmental organization (NGO) leaders and their organizations. Over the past 14 years, Ford of China has awarded more than \$3 million in grants to 354 grassroots environmental leaders and NGOs. In 2014 we provided grants for projects in China, South Korea, Malaysia, Myanmar, Hong Kong, Mongolia, Tahiti, Laos, Cambodia, Sri Lanka and Fiji, and in 2015 we will expand the program to Thailand.

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Education has emerged as the most important factor determining individual and community economic success and prosperity in an increasingly global economy. In short, it is a building block for success for everything else in our communities. Education creates a sustainable society. Without a sustainable society, we don't have a sustainable company for employees, customers, investors or dealers.

The Ford Fund is committed to working with communities around the world to drive sustainable innovation in education. To this end, we support grassroots programs and initiatives that accelerate educational innovation, build sustainable communities and drive opportunity and access to higher education for students. The Ford Fund donates approximately \$8 million dollars each year to education, about one-third of our total annual financial support. In 2014, we donated an additional \$1 million to new scholarships and educational programs.

*Highlighted projects:*

## Blue Oval Scholars Program

### *United States*

Our Ford Blue Oval Scholars program awards hundreds of scholarships each year to students throughout the U.S. The program includes a Web-based initiative that links scholarship winners together through an online portal, allowing them to connect with Ford and others in a variety of ways. The program also sponsors an annual "Heart Behind the Oval" scholarship contest that recognizes and rewards students making a difference in their communities. In 2014, we announced a new Ford Blue Oval STEM Scholarship Program that will provide \$500,000 in scholarships over four years to 50 students interested in pursuing degrees in the science, technology, engineering or mathematics (STEM) fields. In 2014, the Ford Fund awarded more than \$1 million in college scholarships.

*Also see:*

 [Ford Blue Oval Scholar Scholarships](#)

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## Taking Ford's College Community Challenge Global

### *United States*

In 2014, we continued to expand the Ford College Community Challenge, a program that invites college partners to work with their local communities to put together innovative, student-led proposals that use the school's resources and capacity to address the theme of Building Sustainable Communities, in an innovative way. In 2014, we took this project global, expanding grants to Brazil and China, as well as the U.S. Through this program, the Ford Fund awarded \$280,000 in 2014 to fund the implementation of 16 winning projects. Since the program began in 2008, we have awarded more than \$1.7 million to build sustainable communities.

*Also see:*

## Ford Driving Dreams through Education

 *United States*

Ford Driving Dreams through Education program is a competitive, grant-based initiative, aimed at motivating Latino students to complete high school on time and pursue higher education. To date, 26,000 students have been positively impacted by the program. The program raises awareness about the importance of education by energizing youth, broadening community-wide support and providing resources for area schools and students. Through scholarships, motivational student assemblies, peer-to-peer support and an innovative contest, the signature program motivates students to graduate from high school on time and enroll in college.

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## Ford Next Generation Learning

 *United States*

Ford Next Generation Learning (Ford NGL), the Ford Fund's flagship education program, mobilizes educators, employers and community leaders to develop a new generation of young people who will graduate from high school prepared for both college and careers. Ford NGL improves teaching and learning, promotes the development of career- and interest-themed high schools to better serve students, and aligns business and civic engagement in education to improve student and workforce outcomes. Through this program we work with national, regional and local partners to prepare young people to compete successfully in higher education and in the global, 21st century economy. In 2015, this program will reach more than 200,000 students in 23 communities across the U.S.

---

## Henry Ford Academies

 *United States*

Through the Henry Ford Academies (HFA) program, Ford has replicated its award-winning small high school model – which we started with the original Henry Ford Academy, located on the grounds of The Henry Ford in Dearborn, Michigan – in Detroit and San Antonio. Students at these schools benefit from the new HFA model curriculum, which is thought to be the first in the nation to focus explicitly on innovation and creativity.

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## Ford STEAM Lab in Detroit

 *United States*

In 2014, the Ford Fund piloted the Ford STEAM (Science, Technology, Engineering, Arts and Math) Lab Challenge, a collaborative initiative to excite, inspire and uncover students' passion and talent for STEAM careers and "Techpreneurship" (technology + entrepreneurship). Through this new program, 165 Detroit middle school students came together at the Ford Resource and Engagement Center in southwest Detroit to learn about various STEAM career pathways and opportunities through Techpreneurship.

---

## Helping Youth Build Everyday Financial Skills

 *United States*

As part of our Accelerated Action Day program, Ford employee volunteers guided middle school students through a hands-on, experiential experience at a "Finance Park." Each student was given a life scenario (age, family size, annual income, income tax rate and profession), and helped to calculate his or her monthly income and

create a realistic budget. Then, students visited the Finance Park's 14 storefronts (which include a bank, insurance agency, car dealership, retail and grocery stores, utility company and financial services provider) to determine what items – necessities and discretionary – they could afford. Ford employees helped students with the calculations and decisions about how to stay within their budgets and facilitated discussions about how education and career decisions will affect their future career and economic situations.



---

## Continuing to Build a Better Future for Orphaned Children

### 📍 Poland

In Kuluszyn, Poland, during our Global Week of Caring, 45 Ford volunteers spent 360 hours providing support to children living at the Falbogi State Orphanage, as part of a long-term project that began in 2009. The goal is to give the children tools, knowledge, supplies, equipment and experiences so they can plan for their future and make educated choices for their adult lives. The orphanage is isolated in a rural area, and children rarely leave the property except for school trips that are funded by Ford volunteers. Also, they have very limited access to the internet due to lack of equipment. Over the years, Ford volunteers have donated materials and time to set up a computer lab in the orphanage. They also provide relevant computer and Internet skill training to help children gain practical skill sets that they need to succeed in their post-orphanage years.



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## Building Brighter Futures with Happy Schools

### 📍 India

In India, we launched the Happy Schools program in 2014, a long-term intervention focused on democratizing access to primary education. As part of the program, Ford has partnered reputed NGOs working in the field of education to collectively conceptualize and design a social intervention model that addresses gaps identified in the schools. Besides academic support and infrastructure enhancement, the program focuses on improving the overall health status of the children, as well as the introduction of application-based learning and a structured arts curriculum. A critical component of the program is engagement with key stakeholders, including school administrators, teachers and parents, in order to create sustained support systems for the children. So far the program has been implemented in 20 schools in Chennai. Ford India is expanding the program to cover 10 schools near the new facility in Sanand, Gujarat.





As an automotive company, the safety of drivers and pedestrians is an obvious priority for us. The Ford Driving Skills for Life (Ford DSFL) program is the centerpiece of our efforts to improve driver safety.

*Highlighted projects:*

## Ford Driving Skills for Life

### [Worldwide](#)

The Ford Fund continues to support safe driving through its award-winning Ford DSFL program, a free safe-driving curriculum that has trained hundreds of thousands of drivers through Web-based and in-person driving sessions, which we began in 2003. In the U.S. the program focuses on teen drivers. It was developed by Ford, the Governors Highway Safety Association and a panel of safety experts to address the number one killer of teens in the U.S. – traffic crashes. In 2013, we expanded the teen-focused driving safety program to Europe, and in 2014, we expanded it to Canada.

We are also continuing to expand Ford DSFL in developing markets, where it focuses on first-time drivers of all ages and includes eco-driving information. In 2014, the program continued in mainland China, India, Taiwan, Thailand, Indonesia, Vietnam and the Philippines, and also expanded to Malaysia and Myanmar, training another 15,000 people. In the Middle East and Africa region, we launched Ford DSFL in Dubai, United Arab Emirates, and expanded it to Saudi Arabia in 2014. In 2015, we plan to expand the program to Australia, Oman, Bahrain, Qatar, and the United Arab Emirates.

Also see:

[> Encouraging Safer Driving](#)

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## Supporting Road Safety

### [Asia Pacific Region](#)

Ford supports programs run by the Asia Injury Prevention Foundation (AIPF) to bolster its public awareness campaigns to make roads safer in Vietnam, China and Thailand. Their campaigns aim to educate the public on the importance of helmet use, safe walking behaviors and general road safety. With the support of Ford, the AIPF was able to develop a TV commercial and billboards in Vietnam as well as develop a road safety education video and curriculum in China. Community events in Vietnam, China and Thailand were also implemented to improve road safety knowledge and behaviors. These programs reached approximately 21 million people in five different communities.

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# Assessing the Larger Benefits of Our Community Engagement

It is challenging to assess the larger benefits of our community engagement and investments to the communities in which we operate. We know the dollar amounts of projects we fund and charitable contributions we make. And we know the number of hours our employees volunteer in their local communities through Ford-sponsored projects.

For 2014, these numbers were substantial: We contributed \$200,000 in mini-grants to support our employee volunteer projects. Ford employees volunteered more than 160,000 hours, the equivalent of giving approximately \$3.5 million to our local communities. However, these numbers are just the "inputs;" they don't adequately convey the larger positive impact of our efforts.

\$200,000 contributed in mini-grants and more than  
**160,000 hours**  
volunteered by our employees.

We are trying to improve our ability to measure this larger positive impact. For example, we believe that our volunteer efforts in 2014 positively impacted more than 2 million people. At this point, our understanding of the larger impact of our projects is often anecdotal. However, these anecdotes are still important and inspiring. For example, we know that by building wells in India and South Africa through our [Global Week of Caring](#) projects, we have enabled girls in local villages, who would otherwise have to walk miles to gather water for their families, to attend school instead.

We will continue to try to improve our ability to measure these kinds of larger impacts in years to come.

**READ MORE:**

See examples of the Ford Fund's programs and projects in 2014.

> [Building a Better World: Ford's Community Projects Around the World](#)

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# Data

Data on this page:

- A. [↓ Charitable Contributions](#)
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## A. Charitable Contributions

\$ million

	2009	2010	2011	2012	2013	2014
<b>Ford Motor Company Fund</b>	20	19	20	21.6	26.3	<b>30.2</b>
<b>Corporate</b>	9	10	10	8.5	11.4	<b>15.4</b>
<b>Total</b>	29	29	30	30.1	37.7	<b>45.6</b>

Also see:

- > [Community Engagement and Investment](#)

## B. Volunteer Corps

Thousand volunteer hours

	2009	2010	2011	2012	2013	2014
	100	112	110	115	150	<b>160</b>

Also see:

- > [Community Engagement and Investment](#)

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## Case Study: Engaging With Our Communities on Water



*Ford volunteers are working to restore water supplies in villages hit by Super Typhoon Yolanda (Haiyan)*

For many years, we have demonstrated our commitment to sound water management in our own operations, focusing on water efficiency, effluent quality and water reuse. But we also are committed to moving beyond our own fence-line to address water issues within the communities in which we operate. We are working with stakeholders to better understand issues around access to water and sanitation, especially in water-stressed communities.

We're investing in water stewardship projects around the world, especially in areas where access to potable water is limited. As we expand into new markets in more water-stressed regions, we are increasing our engagement with local communities on water issues.

Through our CEO Water Mandate commitments, we will work within the communities where we operate, as appropriate by location, to facilitate access to water, sanitation and hygiene, and promote sustainable management of water resources by:

- using outreach opportunities, such as the [Global Week of Caring](#) and [Ford Volunteer Corps' seasonal initiatives](#), to support water stewardship;
- exploring innovative, market-based approaches to community water programs; and
- documenting our journey through this annual corporate Sustainability Report.

*We are increasing our engagement with local communities on water issues.*

### Increasing Our Focus on Water Projects

In 2014, we increased our focus on water-related projects, including by funding projects that provide clean drinking water facilities in many communities near our operations. Our Ford Motor Company Volunteer Corps, for example, placed a priority on water-based community projects during our Global Week of Caring (GWC). Approximately 35 percent of our GWC projects addressed water-quality or water-access issues, and Ford volunteers implemented water-related projects in 19 countries across all of our five operating regions.

In China, 20 Ford volunteers spent 160 hours helping to build eight water cellars, which can store water in the rainy season for use in the dry season. Volunteers also implemented a one-day activity to raise awareness of water conservation and use.

In the Philippines, more than 300 volunteers spent nearly 2,500 hours on two projects to restore the water supply in the village of Villaba, which was hit hard by Super Typhoon Yolanda (Haiyan) in November 2013. Six months after the disaster, most people in the region still had not recovered. As part of the project, volunteers also restored the water supply in the village of Leyte and provided 50 concrete top stand faucets, each benefiting five families.

In Argentina, 14 Ford volunteers installed water pipes in rural communities to provide access to clean drinking water for local residents.

And in India, 65 Ford volunteers spent more than 250 hours installing water purifiers, which they donated, at local schools. The schools the benefited were Maharana Memorial Public School in Gurgaon; Karattumedu Elementary School; Sharma Memorial Nursery & Primary School (Children's Garden School); Seva Samaj School; and Karpagavalli School. The purifiers will greatly benefit the children and staff by providing them with daily access to safe drinking water. Volunteers also provided education on water conservation issues to the 1,800 children and staff at the schools.

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*We fund projects that provide clean drinking water facilities in many communities near our operations.*

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## Contact

Preparing this report is a valuable opportunity for us to assess and improve upon our economic, environmental and social progress and performance.

To continue to do so, we need your feedback.

**Write:**

Sustainability & Vehicle Environmental Matters  
Ford Motor Company  
One American Road  
Dearborn, MI 48126  
U.S.A.

**Email:**

[sustaina@ford.com](mailto:sustaina@ford.com)

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## Glossary

<b>3TG</b>	Tantalum, tin, tungsten and gold
<b>ABF</b>	Aligned Business Framework, Ford's strategy for working more closely with key suppliers
<b>ACC</b>	Adaptive Cruise Control, a technology that helps drivers maintain a safe distance from the vehicle in front of them
<b>ADFSO</b>	Aggressive Deceleration Fuel Shut-Off, a technology for improving fuel efficiency
<b>AIAG</b>	Automotive Industry Action Group, a U.S.-based association of automotive OEMs, suppliers and service providers
<b>Annual Report on Form 10-K</b>	An audited annual financial report required by the U.S. Securities and Exchange Commission containing more detailed information about the company's business, finances and management than the annual report
<b>AP</b>	Asia Pacific, a Ford region
<b>B car</b>	Generic term for a small or subcompact car (e.g., the size of a Ford Fiesta)
<b>BEV</b>	Battery electric vehicle, a vehicle that has no internal combustion engine and does not use any onboard gasoline; instead, it runs on a high-voltage electric motor
<b>BDR</b>	Billion Dollar Roundtable, an exclusive group of companies that purchase a minimum of \$1 billion annually from diverse suppliers
<b>Biodiesel</b>	A diesel alternative made from vegetable oils obtained from oil seeds, including soy, canola, palm and rapeseed, or from animal fat
<b>BLIS</b>	Blind Spot Information System, a technology that uses radar sensors to help inform the driver when a vehicle is detected in the blind spot zone
<b>Blueprint for Mobility</b>	Our multi-decade strategy to create a better world. The Blueprint for Mobility is our strategic framework. Ford Smart Mobility, announced in early 2015, combines key initiatives to deliver our vision for meeting mobility needs.
<b>Blueprint for Sustainability</b>	Several years ago, this term was introduced at Ford to describe the actions we are taking to achieve outstanding fuel economy and reduce greenhouse gas emissions from our products. Now we use the term more broadly to describe our sustainability strategy as a whole, in recognition of the fact that our important sustainability issues are part of a complex system that interconnects our products, plants and people and the communities in which we operate.
<b>BMS</b>	Battery Management System, a Ford technology that improves the efficiency of a vehicle's electrical system
<b>BPR</b>	Business Plan Review meetings, one of Ford's key management processes
<b>CAA</b>	U.S. Clean Air Act

<b>CAFE</b>	Corporate Average Fuel Economy, a U.S. regulation requiring auto companies to meet certain sales-weighted average fuel economy levels for passenger cars and light trucks and report these numbers annually
<b>CAMP</b>	Crash Avoidance Metrics Partnership, an association of original equipment manufacturers, suppliers and the U.S. government conducting pre-competitive research on active safety features
<b>C car</b>	Generic term for a compact car (e.g., the size of a Ford Focus)
<b>CDP</b>	Formerly known as the Carbon Disclosure Project, the CDP is a nonprofit organization to which Ford and other companies report their greenhouse gas emissions and water use
<b>Ceres</b>	A network of investors, environmentalists and other public interest groups that works with companies and investors to address sustainability challenges
<b>CAF</b>	Our Chinese joint venture, formerly known as Changan Ford Mazda Automobile Co. Ltd., (FMA) and recently restructured as Changan Ford Automobile Corporation, Ltd. (CAF) to increase our ownership percentage
<b>CNG</b>	Compressed natural gas, a type of alternative fuel
<b>CO<sub>2</sub></b>	Carbon dioxide, a primary greenhouse gas
<b>Conflict Free Sourcing Initiative</b>	A resource for companies from a range of industries addressing conflict minerals issues in their supply chains
<b>Conflict Minerals</b>	Gold as well as columbite-tantalite (coltan), cassiterite, wolframite, or their derivatives, which are limited to tantalum, tin and tungsten, sourced from areas of violent conflict in the Democratic Republic of the Congo (DRC) and adjoining countries
<b>CSR Europe</b>	The leading European business network for Corporate Social Responsibility.
<b>DfS</b>	Design for Sustainability, a tool for bridging the gap between product development and environmental and social issues
<b>DOE</b>	U.S. Department of Energy
<b>E85</b>	A fuel blend of 85 percent ethanol and 15 percent gasoline
<b>EcoBoost<sup>®</sup></b>	Ford engine technology that uses turbocharging, direct injection and reduced displacement to increase fuel economy and performance while reducing CO <sub>2</sub> emissions
<b>ECONetic</b>	A line of European Ford model vehicles with reduced CO <sub>2</sub> emissions
<b>Electrification</b>	The process of developing the technology and infrastructure necessary to replace traditional oil-based vehicle fuels with electricity
<b>ELP</b>	Ford's Experienced Leader Program (ELP), a leadership development program aimed at middle management
<b>ELV</b>	End-of-life vehicle; an EU Directive requires manufacturers to take back ELVs and ensure environmentally sound recycling and disposal
<b>EMOS</b>	Ford's Energy Management Operating System, a mechanism for integrating energy-efficient principles into the facility design, manufacturing/engineering processes, and operations of Ford Manufacturing, Office and Engineering facilities
<b>Environmental aspects</b>	The elements of an organization's activities, products and services that can interact with the environment
<b>EOS</b>	Ford's Environmental Operating System, which is integrated with ISO 14001 and used for driving environmental compliance

<b>EPA</b>	The Environmental Protection Agency, a U.S. government agency
<b>EPAS</b>	Electric power assisted steering, a technology that boosts fuel economy and decreases CO <sub>2</sub> emissions
<b>ERGs</b>	Ford's Employee Resource Groups, affinity networks at the company that are intended to foster diversity and inclusion
<b>ESI</b>	Employee Satisfaction Index, eight questions on Ford's annual Pulse survey of employees
<b>Ethanol</b>	A gasoline alternative, typically derived from plant material (e.g., corn, sugar cane, sugar beets); can also be made from petroleum. Plant-derived ethanol is also sometimes called bioethanol.
<b>EU</b>	European Union
<b>Euro 4, Euro 5, Euro 6</b>	Europe's tailpipe emissions standards; Euro 5 standards have been completely phased in for light-duty vehicles in Europe as of January 1, 2012. Euro 6 standards have been developed and will be applied beginning in September 2014.
<b>EV</b>	Electrified vehicle, a generic term for any vehicle that is powered – at least in part – by an electric motor
<b>EVP</b>	Employment Value Proposition, defined as why people choose a given employer and then stay with that employer
<b>FCV</b>	Fuel cell vehicle, a vehicle that uses an onboard fuel cell to create electrical power through a chemical reaction based on hydrogen fuel
<b>Ford DSFL</b>	Ford Driving Skills for Life, our driver education program
<b>FFV</b>	Flexible fuel vehicle, a vehicle that can be run on any blend of unleaded gasoline with up to 85 percent ethanol
<b>Flexible manufacturing</b>	The use of common platforms and shared manufacturing technologies that allow a single plant to make multiple models and switch relatively rapidly between them, allowing faster response to changing customer demand
<b>FoE</b>	Ford of Europe, a Ford region
<b>FPS</b>	Ford Production System, a continuously improving, lean, flexible and disciplined common global production system
<b>FSAO</b>	Ford South America Operations – a Ford region
<b>Fuel cell</b>	A type of power plant that generates electricity by combining oxygen and hydrogen, and can be used in different sizes and configurations to power vehicles or buildings
<b>Fuel economy</b>	The distance that can be traveled on a single gallon of fuel
<b>Fuel efficiency</b>	The amount of fuel needed to move a vehicle of a certain weight a certain distance
<b>GEL</b>	Ford's Global Executive Leadership Program, a leadership development program geared toward directors and senior managers
<b>GEM</b>	Ford's Global Emissions Manager database, used for measuring, monitoring and recording environmental data
<b>GHG</b>	Greenhouse gas, for example carbon dioxide (CO <sub>2</sub> ), nitrous oxide (N <sub>2</sub> O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF <sub>6</sub> ) or water vapor
<b>GLS</b>	Ford's Global Leadership Summit, a leadership development program aimed at executives and general managers

<b>GMAP</b>	Ford's Global Material Approval Process, a materials management process
<b>Go Further</b>	Ford's global brand promise to express what we stand for as a company
<b>GPDS</b>	Global Product Development System, Ford's system for integrating product development with manufacturing
<b>GQRS</b>	Global Quality Research System, which tracks "Things Gone Wrong" and is Ford's primary quality survey
<b>GRI</b>	Global Reporting Initiative, a multi-stakeholder process and independent institution whose mission is to develop and disseminate globally applicable sustainability reporting guidelines
<b>GTDI</b>	Gasoline turbocharged direct injection
<b>HEV</b>	Hybrid electric vehicle; a full hybrid can run exclusively on battery power, exclusively on gas power or on a combination of both
<b>IIHS</b>	Insurance Institute for Highway Safety, a U.S.-based nonprofit organization
<b>IMDS</b>	International Material Data System, a materials reporting system used by multiple automakers
<b>Indirect Suppliers</b>	Suppliers of facilities, materials and services
<b>ISO 14001</b>	The leading global environmental management system standard, developed by the International Organization for Standardization
<b>JDRF</b>	The leading global organization focused on type 1 diabetes research
<b>JMC</b>	Jiangling Motors Corporation, Ltd., one of Ford's joint ventures in China
<b>LEED</b>	Leadership in Energy and Environmental Design, the "green building" rating system of the U.S. Green Building Council
<b>LEV</b>	Low Emission Vehicle, a level of standards for tailpipe emissions (hydrocarbon, carbon monoxide and oxides of nitrogen) enforced in California and states that have adopted California standards
<b>LEV program</b>	The unique vehicle emissions program adopted by California for the control of tailpipe and evaporative emissions that provides several sets of emissions standards
<b>Life cycle assessment</b>	Process of assessing the environmental, social and economic impacts of a product system over its entire life cycle, from cradle to grave, including material production, product manufacture, product use, product maintenance and disposal at end of life
<b>LPG</b>	Liquefied petroleum gas (also known as propane or Autogas), a type of alternative fuel
<b>Materiality</b>	Materiality as used in this sustainability report does not share the meaning assigned to this concept for purposes of financial reporting. For the purposes of this report, we consider material information to be that which is of greatest interest to, and which has the potential to affect the perception of, those stakeholders who wish to make informed decisions and judgments about the company's commitment to environmental, social and economic progress.
<b>Materiality Analysis</b>	An analysis that scans, identifies and reviews sustainability issues that are of the highest concern to our stakeholders and that could significantly affect our company's ability to execute its business strategy
<b>MEA</b>	Middle East and Africa, a Ford region
<b>Megatrends</b>	Great forces in societal development that interact and affect each other and will also affect governments, markets and civil society for many years to come

<b>MPGe</b>	A mile-per-gallon equivalency metric for electrified vehicles
<b>MP&amp;L</b>	Ford's Material Planning and Logistics organization, whose responsibilities include designing and operating our global transportation networks and engineering high-quality and efficient packaging to protect material in transit
<b>MQL</b>	Ford's Minimum Quantity Lubricant machining process
<b>MY</b>	Model Year, the manufacturer's annual production period which includes January 1 of the calendar year. For example, production of 2016 model year vehicles might begin in June 2015 and end in May 2016, but could start as early as January 2, 2015, and end as late as December 2016. We report fuel economy by model year because that is how it is reported to government agencies, and therefore, this data corresponds to what is available in the public domain.
<b>NADA</b>	National Automobile Dealers Association, an industry association of car and truck dealers
<b>NCAP</b>	New Car Assessment Program, a term commonly used to denote an official, independent vehicle testing and/or rating system. Separate NCAPs now exist in the United States, Europe, Australia, China, and Central and South America.
<b>NEDC</b>	New European Driving Cycle, the testing procedures used to determine compliance with government fuel economy and emissions requirements.
<b>NGO</b>	Nongovernmental organization
<b>NHTSA</b>	National Highway Traffic Safety Administration, a U.S. government agency
<b>NMOG</b>	Non-methane organic gases
<b>NOV</b>	Notice of violation (e.g., from a regulatory agency)
<b>NPRI</b>	National Pollutant Release Inventory (Canada), similar to U.S. TRI
<b>NSC</b>	National Safety Council
<b>OEM</b>	Original equipment manufacturer
<b>OHS policy</b>	Ford's Occupational Health and Safety policy
<b>One Ford</b>	Ford's accelerated restructuring plan; One Team unified in pursuing One Plan to deliver One Goal: An exciting, viable Ford
<b>OSRP</b>	Occupant Safety Research Partnership, a group within the U.S. Council for Automotive Research that researches and develops advanced crash test dummies and other pre-competitive safety systems
<b>PAS</b>	Ford's Partnership for Advanced Studies, our flagship education program
<b>PACE</b>	The Partnership for A Cleaner Environment, a recently launched environmental supply chain sustainability initiative to reduce the collective environmental footprint of Ford and our automotive supply chain
<b>PDGs</b>	Public Domain Guidelines, internal Ford guidelines that focus on ensuring that our vehicles earn top marks in public domain assessments
<b>PEC</b>	Paint Emissions Concentrator, formerly called "fumes-to-fuel," a technology that concentrates volatile organic compound (VOC) emissions from the painting process by approximately 1,500:1, allowing VOCs to be burned as a fuel source
<b>PHEV</b>	Plug-in hybrid electric vehicle, a vehicle similar to an HEV in that it is equipped with both an electric battery and a gas-powered engine; however, PHEVs are equipped with a high-capacity battery that can be charged from an ordinary household outlet

<b>PPA</b>	Public-Private Alliance for Responsible Mineral Trade, a joint initiative among governments, companies and civil society to support supply chain solutions to conflict minerals challenges
<b>Production Suppliers</b>	Suppliers of parts that end up on the vehicles Ford manufactures
<b>PSI</b>	Product Sustainability Index, a tool used by Ford of Europe to incorporate life cycle analysis into product development
<b>Pulse survey</b>	Ford's annual, voluntary survey of salaried-employee satisfaction
<b>PZEV</b>	Partial Zero Emission Vehicle, a vehicle standard that is part of the LEV II Program
<b>QOS</b>	Ford's global Quality Operating System, used in our manufacturing to develop, measure and continuously improve robust processes
<b>REACH</b>	Registration, Evaluation, Authorization and Restriction of Chemical Substances (EU legislation)
<b>REEs</b>	Rare Earth Elements, a suite of mined materials widely used in consumer and automotive electronics
<b>RFS</b>	Renewable Fuel Standard, a provision within the U.S. Energy Independence and Security Act of 2007 requiring a significant increase in the use of biofuels
<b>SAR</b>	Special Attention Review, a Ford management process
<b>SOS</b>	Ford's Safety Operating System, a component of Ford's overall manufacturing strategy and provides for the health and safety of our employees
<b>SDGs</b>	Safety Design Guidelines, Ford's stringent internal engineering design targets
<b>Six-speed transmission</b>	A transmission using six gears, for improved fuel economy compared to typical four-speed transmissions
<b>SQDCPME Scorecard</b>	A scorecard that helps us keep focused on the vital components of a sustainable business: Safety, Quality, Delivery, Cost, People, Maintenance and Environment
<b>SSI</b>	Ford's Salaried Supervisor Institute/Program (SSI), a leadership development program for new and experienced leaders
<b>Stakeholder</b>	Anyone who is impacted or believes they are impacted by the operations or practices of the company, including customers, employees, business partners, shareholders, governments, communities and nongovernmental organizations. Some also consider the environment a stakeholder.
<b>STEM</b>	Science, technology, engineering and mathematics.
<b>Sustainability</b>	A business model that creates value consistent with the long-term preservation and enhancement of environmental, social and financial capital. Also, meeting the needs of the present without compromising the future.
<b>Sustainable Technologies and Alternative Fuels Plan</b>	Ford's product strategy, outlining the near-, mid- and long-term steps we are taking to develop and deploy vehicle and fuel technologies to implement our blueprint for sustainability
<b>SULEV</b>	Super Ultra-Low Emission Vehicle, a level of standards for tailpipe emissions enforced in California and states that have adopted California standards
<b>SUMURR</b>	Sustainable Urban Mobility with Uncompromised Rural Reach, a Ford framework that focuses on positively impacting communities in developing nations
<b>SUV</b>	Sport utility vehicle
<b>Tank-to-wheels CO<sub>2</sub> emissions</b>	A subset of well-to-wheels CO <sub>2</sub> emissions; includes the CO <sub>2</sub> generated by

	burning the fuel in the vehicle
<b>TCR</b>	The Climate Registry, a voluntary carbon-emissions reporting project
<b>TGW</b>	“Things Gone Wrong,” a metric measured by the Global Quality Research System (GQRS)
<b>Tier 1 Suppliers</b>	Suppliers sourcing directly to our assembly plants
<b>Tier 2 Suppliers</b>	Suppliers not sourcing directly to our assembly plants
<b>Tier 2 and Tier 3 Emissions Standards</b>	The U.S. federal program, starting with the 2004 model year, to control vehicle emissions standards. Tier 3 emissions standards, which are more stringent than Tier 2 standards, were proposed in 2013.
<b>TRI</b>	Toxics Release Inventory, an inventory of releases and transfers of certain chemicals that are required to be reported to the U.S. government
<b>UAW</b>	The International Union, United Automobile, Aerospace and Agricultural Implement Workers of America
<b>UNGC</b>	United Nations Global Compact, a global policy initiative through which businesses agree to align their operations with 10 principles in the areas of human rights, labor, environment and anti-corruption
<b>URP</b>	University Research Program, a Ford program for collaborating with researchers at more than 100 universities worldwide
<b>V2I</b>	Vehicle-to-infrastructure communications, technologies that enable vehicles to “talk” to roadway infrastructure (such as traffic lights) via advanced Wi-Fi signals or dedicated short-range communications
<b>V2V</b>	Vehicle-to-vehicle communications, technologies that enable vehicles to “talk” to each other via advanced Wi-Fi signals or dedicated short-range communications
<b>VIAQ specifications</b>	Ford's Vehicle Interior Air Quality specifications, which require the consideration of the air-quality and allergen impacts of the materials and components in our vehicles
<b>VOCs</b>	Volatile organic compounds, compounds that vaporize (become a gas) at relatively low temperature
<b>WBCSD</b>	World Business Council for Sustainable Development
<b>Well-to-tank CO<sub>2</sub> emissions</b>	A subset of well-to-wheels CO <sub>2</sub> emissions; measures the CO <sub>2</sub> generated by excavating the feedstocks and producing and distributing the fuel or electricity
<b>Well-to-wheels CO<sub>2</sub> emissions</b>	Accounts for emissions from the vehicle itself, as well as CO <sub>2</sub> emissions resulting from the production and distribution of fuel
<b>WET</b>	Water Estimation Tool, a Ford software program that helps facilities to predict their water usage
<b>WHO</b>	World Health Organization, the international organization providing leadership on global health matters
<b>WRI</b>	World Resources Institute, a U.S.-based nonprofit organization
<b>ZEV</b>	Zero Emission Vehicle, the lowest level of standards for vehicle emissions enforced in California and states that have adopted California standards

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