

Ford



**SUSTAINABILITY
REPORT 2016/17**



www.sustainability.ford.com

STRATEGY AND GOVERNANCE

We're committed to having a positive impact on the world, while remaining a successful business.

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And we're trusted by investors and other stakeholders to operate responsibly and transparently, living our promise to Go Further, The Right Way.

With operations in more than 100 countries, we have clear policies and strategies for creating value, continually improving our performance and addressing a wide range of social, economic and environmental challenges in a changing world. And we keep them under continual review to reflect global best practice.

With ethics and compliance as the foundation of all our business activities, our integrated governance systems and processes help us manage the different aspects of sustainability across our business, from climate change to product quality and safety, and from ethical business practices to managing our supply chain.

How We've Gone Further



Continuing to Transform What We Do and How We Do It

We continue to develop and expand our business model, encompassing our core automotive business of making, selling, servicing and financing vehicles, while pursuing emerging opportunities in electrification, autonomous vehicles, and mobility services and solutions.

> [Read about our sustainability strategy](#)



Still One of the World's Most Ethical Companies®

We were named in the World's Most Ethical Companies® list by the Ethisphere Institute in March 2017, the eighth consecutive year that we have received this accolade for our efforts to be a good corporate citizen.

> [Read more about ethics and governance](#)



Promoting Human Rights Everywhere We Operate

This year, we used the UN Guiding Principles Reporting Framework for the first time to help us understand and demonstrate that we are meeting our responsibility to respect human rights in practice.

> [Read more about human rights and working conditions](#)



Engaging With Stakeholders to Understand Key Issues

Our most recent materiality review and ongoing engagement with stakeholders help us understand and prioritize the sustainability issues that are most important to our business and our stakeholders.

> [Read more about how we prioritize key issues](#)

Letter From William Clay Ford, Jr. and Jim Hackett

"Contributing to a better world has always been a core value at Ford, and our commitment to sustainability is a key part of who we are. Our vision is to create an even more dynamic and vibrant company that improves people's lives around the world and creates value for all of our stakeholders."

Since Ford's earliest days, our company has been on the leading edge of change. Never more so than today, as the automotive industry experiences the most fundamental shift in 100 years. Rapidly growing cities and an expanding global middle class mean issues like air quality, congestion, and associated social and environmental impacts are important challenges facing us all. Ford's dedication to sustainability has never been stronger as we further strengthen our automotive business and accelerate a strategic shift to capitalize on emerging opportunities.

Climate change is having a significant impact on the planet. Everyone has to work together and do their part to bring about real change. We remain absolutely committed to improving fuel efficiency and reducing emissions for our customers, and we continue to pursue our electrification and sustainable manufacturing strategies to do our part to help to address climate change issues. We will continue to urge the U.S. to collaborate globally to advance climate change solutions that include contributions from every sector and every country. At the same time, we have challenged ourselves to go further by setting stretch goals to reduce climate-related impacts in our facilities.

As we look to the future, we are moving from a position of strength to transform Ford. Together, we are committed to sharpening operational execution, modernizing Ford's present business and transforming the company to meet tomorrow's challenges.

For example, our \$4.5 billion investment in electrification – which includes our plan to introduce 13 new electric vehicles globally in the next five years – will offer our customers more capability, productivity and performance, and better fuel economy. In autonomy, our intent is to have a fully autonomous vehicle that brings safety to a new level for the user and solves their everyday needs. In mobility, we formed our City Solutions team, the only one of its kind in the auto industry, to work with cities to propose, pilot and develop mobility solutions tailored to individual communities.

While growing the business profitably, our fundamental mission remains the same: to make people's lives better. For Ford, the distinction between a good company and a great one is that a good company delivers excellent products and services; a great company delivers excellent products and services, and strives to make the world a better place. This is why our community involvement and investment are cornerstones of our corporate citizenship. Each year, we support thousands of Ford employees who put their heart and soul into projects that give something back. We also continue to invest significantly in our communities through the Ford Fund.

As part of Ford Project Better World, we are looking beyond the traditional role vehicles play in society and are pursuing solutions to address human challenges faced around the globe. Those challenges take us to underserved communities where we can use advanced vehicle and connectivity technologies to provide people with critical services they need, like health care and education.

Our efforts in sustainability and corporate citizenship again have been recognized globally. For the eighth straight year, Ford was named one of the World's Most Ethical Companies® by the Ethisphere Institute – a reflection of Ford's core values and employees' commitment to corporate social responsibility at every level of our company.

As we continue to focus on creating sustained economic, social and environmental value, we know that everyone has a vital part to play. That is why we are continuing to embed sustainability across our business and continuing to work with stakeholders around the world.

Ford is a global company with social and environmental impacts on the world, and we understand that sustainability is a journey rather than a destination. We are committed fully to meeting the challenges and opportunities that lie ahead.



William Clay Ford, Jr.
Executive Chairman

Jim Hackett
President and Chief Executive Officer,
Ford Motor Company

Sustainability Strategy

Our long-term vision is not just about selling more cars. It's to make people's lives better by changing the way the world moves. In the process, we can help shape a better world through acting responsibly and doing our part to address issues that affect people and the planet.

Our Strategy in Brief

In line with our expansion to be an automotive and mobility company, our strategy is to deliver top quartile shareholder returns through automotive and high-growth mobility businesses. At the same time, we are focused on enhancing and transforming how consumers interact with Ford.

Why This Strategy and How Does Sustainability Fit In?

Our strategy reflects the changing world around us. It recognizes seismic shifts in lifestyles, aspirations and consumer trends, especially among millennials, shaped by digitization and the sharing economy. Our plans also address the realities of rapidly growing cities, air quality concerns, congestion and climate change.

Corporate responsibility is a fundamental value within our company, and our business model expansion positions us to lead in areas with huge potential to revolutionize how people move – more easily and with a lighter footprint.

Future transportation has to be part of the answer. This is why Ford is developing mobility solutions such as on-demand ride sharing to complement mass transit, and continuing to invest in advanced vehicle technologies delivering improved fuel economy and emissions.

For all these reasons, our strategy looks to tomorrow as well as today – not only embracing change but helping to shape a better world.

What Are Ford's Strategic Priorities?

We have defined three key priorities as part of our business model expansion – to fortify, transform and grow specific areas in order to generate economic, environmental and social value.

Fortify, Transform

What It Means

Continue to invest in our core business of designing, manufacturing, marketing, financing and servicing cars, SUVs, trucks and electric vehicles.

Challenges and Opportunities in Value Creation

- For our company, investors and stakeholders:
 - Profitable, sustainable business growth
- For society and the environment:
 - Product innovations that offer affordable, improved fuel economy and reduced impacts over the vehicle life cycle without sacrificing performance on the road
 - Lower environmental footprint and increased resource efficiency through world-class manufacturing facilities and processes

Grow

What It Means

Pursue emerging opportunities in the key areas of electrification, autonomous vehicles, and mobility services and solutions.

Challenges and Opportunities in Value Creation

- For Ford:
 - Transforming our business and driving innovation at every level
 - Knowing where to play and how to win in the disruptive mobility arena
 - Working with partners and stakeholders to develop vehicles and mobility solutions of the future
- For society and the environment:
 - Ensuring that the switch to ultra-low/zero-emission vehicles is an effective transition that benefits consumers, cities and the natural environment
 - Creating the legal and regulatory frameworks necessary to support the introduction of electric cars and autonomous vehicles
 - Ensuring that the human factors are understood and addressed, alongside advances in technology

Integrating Sustainability

We are continuing to drive our integration program, which is focused on ensuring that sustainability is part of every key process and decision we take.

“Sustainability has been part of our core at Ford for quite some time. What some might consider a recent trend happened in our company years ago. We have really good examples of water conservation and waste conservation, for instance. But what motivates me is the ‘now’ of sustainability.

Our goal is to engage the 200,000 people in our company in an integrated approach to drive sustainability even further. We’ve come a long way but we have a long way to go. Capturing the hearts and minds of 200,000 people, all moving in that direction, is where we’re going next.”

Kim Pittel

Vice President, Sustainability, Environment and Safety Engineering

> [Watch the full discussion about where sustainability may be heading next, with Kim Pittel, Ford; Walter Robb, Co-CEO, Wholefoods; and Shona Quinn, Sustainability Leader, Eileen Fisher; chaired by John Izzo, CSR Leadership, Author, Advisor.](#)

We’re Working on Capturing Hearts and Minds

Going Further – The Right Way is how we express Ford’s sustainability agenda. In 2015, we initiated a program of engagement and alignment – to make sustainability real for business units and employees companywide. The program supports Ford’s aspirations for:

- Products and operations with established goals and metrics for improving peoples’ lives and the environment
- Sustainable, affordable mobility: technologies, smart products, services
- Thought leadership, policy advocacy, innovation, collaboration

Program Timeline

Where We Are Now

2015–2017: Inventory Sustainability Initiatives Globally. We’re continuing to assess and analyze our actions that relate to sustainability, enterprise-wide. Demonstrating how these actions link to the corporate vision is essential for recognizing the collective effort and engaging skill teams and business units in going further.

Next Steps

2017–2018: Identify and Develop Synergies – To maximize best practice and efficiencies

2018–2020: Execute Sustainability Strategies – To ensure alignment and impact

Climate Change Strategy

Doing our share to meet the collective challenge of climate change is a key responsibility and a strategic priority for Ford.

OUR STRATEGY AT A GLANCE

A Changing Climate and a Changing World

Over the past decade and more, we have developed a comprehensive approach that puts us in a good place to manage the issues of a changing climate and the opportunities of a changing world.



Reducing Vehicle Emissions in Our Product Lineup

- Improve fuel economy across our global product lineup, through specific fleet CO₂ reductions assessed by region, consistent with regulation and climate stabilization goals
- Offer competitive or “among the leaders” fuel economy for each new or significantly refreshed vehicle
- Offer alternative fuel vehicles
- Maintain our leadership in lightweighting
- Pursue our electrification strategy



Efficient, State-of-the-Art Manufacturing

- Reduce our global CO₂ emissions by 30 percent (per vehicle produced, 2010 to 2025)
- Reduce our global energy consumption by 25 percent (per vehicle produced, 2011 to 2016)



Supporting Our Supplier Base

- Drive positive change with our suppliers, through sharing and encouraging good practices focused on energy, CO₂, water, waste and air emissions
- Engage, improve and report through the CDP and Partnership for A Cleaner Environment (PACE) programs

EXTERNAL FACTORS, RISKS AND OPPORTUNITIES

A Wide Range of Factors Are Continuing to Shape Our Climate Change Strategy



Government Policies

Many governments have introduced increasingly stringent climate change regulations and fuel economy standards. At the same time, innovation in electric vehicles and alternative powertrains is being encouraged, driven by a range of factors including air quality, congestion and future energy security concerns.



Physical Risks

Extreme weather such as flooding and drought can affect automakers’ energy supply and production. Ford assesses climate-related risks to our facilities at least annually. We also work with suppliers through the CDP Supply Chain and PACE programs to build awareness and encourage resilience.



Market Trends

Although consumer demand for advanced engines tends to mirror fuel price movements both up and down, Ford continues to pursue its vision of affordable fuel economy in a low carbon future.



Investor Concern Over Climate Change

Investors are showing greater concern about climate change as a material risk for many companies.

> [For detail on a range of other risk factors, see the Ford annual report 2016 \(Form 10-K\), page 11](#)

> [Read about how our strategy is rooted in climate science](#)

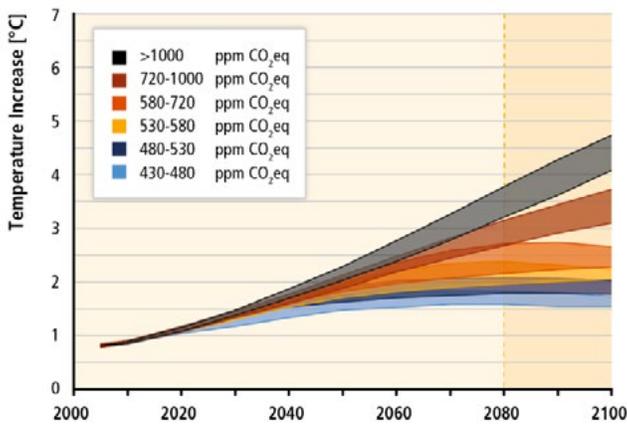
The Science Behind Our Climate Change Strategy

Our climate change strategy is based on our commitment to do our share to stabilize CO₂ in the atmosphere.

Ford's Plans and Targets Are Rooted in Climate Science

Many scientists, businesses and government agencies have concluded that limiting global temperature increase to less than 2°C may help to forestall or substantially delay the most serious consequences of climate change (Figure 1). This is extremely challenging and requires a major effort globally to decrease emissions of CO₂ and stabilize the atmospheric concentration of CO₂ below 450 parts per million (ppm). At the time of writing, atmospheric CO₂ concentrations have already reached approximately 405 ppm.¹

Figure 1. Stabilizing Global Temperature Increase Requires Stabilizing CO₂eq Concentration*



* The CO₂eq concentration represents the climate forcing of all greenhouse gases, which are converted to CO₂-equivalent based on global warming potentials from the IPCC 2nd assessment report.² In 2100, CO₂ represents 80–90% of the CO₂eq concentration or 425–460 ppm CO₂ for less than 2°C temperature increase (480–530 ppm CO₂eq).³ Figure reprinted by permission of IPCC from Climate Change 2014: Mitigation of Climate Change (Cambridge University Press, Figure 6.13 a).⁴

How We Developed Our Approach

- 1  Based on climate science and modeling by recognized authorities, including the U.S. National Center for Atmospheric Research and the International Energy Agency, we developed a model of global and light-duty vehicle (LDV) CO₂ emissions from different regions.
- 2  Using the model, we calculated the stabilization emission reduction levels for LDVs over time, resulting in “CO₂ glide paths” for the LDV sector (Figure 2), taking into account regional differences in vehicle size and fuel consumption, government regulations and biofuel availability.

Ford's estimated share of global LDV CO₂ emissions is about 10%.

- 3  We then applied the sector methodology to our new vehicles, to create Ford-specific “glide paths” (CO₂ reduction goals) for our vehicle lineups across our major operating regions as well as CO₂ reduction targets for our facilities.



To ensure alignment with the latest scientific knowledge, we review our glide path model every year and carry out major updates every five years.

Our CO₂ model is not intended to provide “the answer,” but a portfolio of possible vehicle/ fuel solutions and insights into cost-effective mobility choices in a carbon-constrained world.

In the absence of certainty about future regulations, the glide paths are an approximate guide rather than a precise limitation – being roughly consistent with the overall, long-term trajectory of existing and proposed fuel economy and vehicle CO₂ regulations in a number of markets.⁵

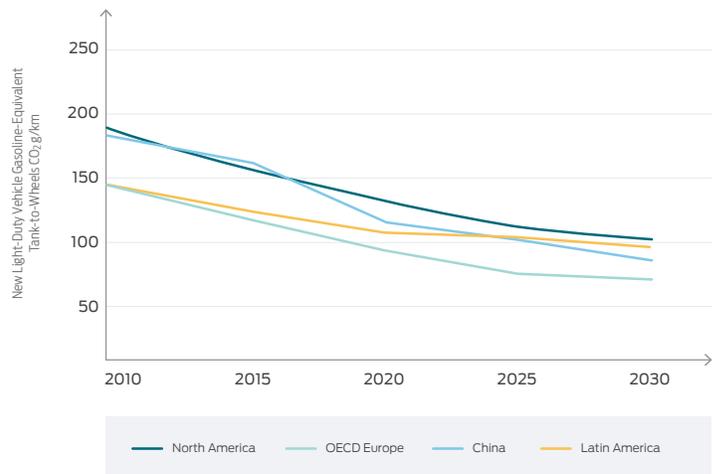
Our Thinking on Sector-Wide Glide Paths

We have shared our thinking behind the development of industry-average CO₂ glide paths (Figure 2) with interested stakeholders, have published the methodology in the peer-reviewed scientific literature⁶ and have received positive feedback and external recognition for our application of climate science to set our CO₂ targets.

By following the 2°C CO₂ glide paths, the automotive and fuel industry would reduce global well-to-wheels absolute CO₂ emissions by about 450 million metric tons (a reduction of 14 percent)⁷ between 2010 and 2030. Ford's share is estimated to be about 10 percent of global LDV fleet emissions.

For the LDV sector to meet the 2°C limit, all automakers must reduce their LDV emissions by the proportion prescribed by the CO₂ glide paths. Although the initial (current) CO₂ emissions rate varies considerably by region, to provide the significant emission reductions needed, all regions need to move toward similar targets.

Figure 2. Industry-Average CO₂ Glide Paths⁸



Delivering Long-Term Reductions Across Our Lineup

Every year we review our product development plans to ensure our vehicles are aligned with the stabilization glide path. While our plans are based upon delivering long-term reductions in CO₂ emissions from new vehicles that are similar to those shown for the industry-average glide paths, we anticipate that in some years, the reductions will be greater or less than those shown in the glide paths.

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 consumers) and multiple other factors that influence our product plans, including regulatory requirements.

Refining Our Model

Because of the long timeframe of climate science, we only update our glide path model's assumptions and input data on a five-year basis. In 2016, we began a major revision, updating the stabilization pathways and forecasts of vehicle sales and biofuel availability. The new stabilization pathway is specific to light-duty vehicles,⁹ instead of an all-sector pathway. Furthermore, the new pathway is based on stabilizing temperature rather than CO₂ concentration. We model a 20 temperature increase stabilization pathway as our base case. In a sensitivity analysis, we explore a 1.5°C pathway to learn about the implications of the COP21 Paris Agreement's call for less temperature increase.¹⁰

Between major updates we conduct sensitivity studies to understand the effect on the glide paths of global changes, such as economic conditions, biofuel availability or regulations. We have also explored which combinations of vehicle and fuel technologies might be most cost-effective in the long-term stabilization of atmospheric CO₂ concentrations. Working with colleagues from government, national laboratories and industry, we have published an assessment of the cost-effectiveness of CO₂ reductions of current (2015) and future (2030) alternative vehicle-fuel technologies.¹¹ In our journey since our first public discussions of the need to reduce CO₂ emissions in the early 2000s, the energy efficiency of vehicles has improved substantially and the costs of further improvements have increased. The imperative of taking a broad multi-sector approach when dealing with climate change is clearer to us now than ever before.

As climate science, alternative fuels and technologies advance, we will be considering ways to refine and adjust our science-based CO₂ targets in future updates – for example, how best to factor in emissions other than CO₂ – and how best to recognize the fact that to address climate change, cost-effective actions across different economic sectors are needed.

At Ford, we believe that collective efforts and a holistic approach to the challenges of climate change are essential. This is why we are focused on collaboration and engagement – working with other sectors, including fuel providers, utilities and even cities – to develop the most efficient solutions. At the same time, we will continue to invest in facilities, products and infrastructure that go beyond today's business models and help create a sustainable future.

1. [E. Dlugokencky and P. Tans, NOAA/ESRL](#), accessed May 2017.
2. IPCC (2014) *Climate Change 2014: Mitigation of Climate Change*, Figure 6.5.
3. IPCC (2014) *Climate Change 2014: Mitigation of Climate Change*, Chapter 6 and Table 6.3.
4. "Figure 6.13 | Changes in global temperature for the scenario categories above 1850–1900 reference level as calculated by MAGICC. (Observed temperatures in the 1985–2006 period were about 0.61 deg C above the reference level – see e.g. WG1 Table SPM.2). Panel a) shows temperature increase relative reference as calculated by MAGICC (10th to 90th percentile for median MAGICC outcomes).."
5. 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 program in the context of the relevant market.
6. S.L. Winkler, T.J. Wallington, H. Maas and H. Hass, "Light-Duty Vehicle CO₂ Targets Consistent with 450 ppm CO₂ Stabilization," *Environ. Sci. Technol.* (2014).
7. Ibid.
8. 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 Procedure (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.
9. IEA. *Energy Technology Perspectives 2016*. OECD/IEA, Paris (2016).
10. [United Nations, Paris Agreement, 2015, FCCC/CP/2015/L.9/Rev.1](#), downloaded February 9th, 2016.
11. A. Elgowainy, J. Han, J. Ward, F. Joseck, D. Gohlke, A. Lindauer, T. Ramsden, M. Biddy, M. Alexander, S. Barnhart, I. Sutherland, L. Verduzco, T.J. Wallington, "Cradle-to-Grave Lifecycle Analysis of U.S. Light Duty Vehicle-Fuel Pathways: A Greenhouse Gas Emissions and Economic Assessment of Current (2015) and Future (2025–2030) Technologies," Argonne National Laboratory Report ANL ESD -16/7 (2016).

Global Mobility

Ford is expanding to become both an auto and mobility company. And by transforming to be a leader in both automotive and mobility, we are better positioned to help create a more sustainable world.

WHY MOBILITY, WHY NOW?

The World is Changing Faster Than Ever Before

Some major global trends and shifting patterns of consumer behavior are driving the transportation revolution we see today:

Crowded Cities and Growing Populations

- Air pollution and congestion
- Strain on transportation systems and highways
- Doubling of the global middle class by 2030 and more car ownership

Nature on the Edge

- Growing demand for energy, water and raw materials
- Climate change impacts from the use and manufacture of vehicles

Changing Consumer Priorities

- New behaviors shaped by the digital world and sharing economy
- Increasing appetite for ride sharing and different ways to own or use a car

Challenges and Opportunities for Ford and the Automotive Industry

- Emerging opportunities in mobility are a substantial potential growth area and a strategic priority for Ford
- The traditional business model no longer applies. There are significant organizational challenges as Ford expands into an auto and mobility company
- The future shape of the industry and the regulatory framework governing future solutions are hard to predict in detail. Multi-stakeholder collaboration and partnering can help foster innovation and success
- There will be winners and losers emerging from the disruptive, dynamic mobility space. Knowing where to play and how to win is key

CHANGING THE WAY THE WORLD MOVES

Targeting Key Growth Areas and Emerging Opportunities

Ford Smart Mobility is our plan to lead in connectivity, autonomous vehicles, data analytics, the customer experience and mobility.

By pursuing emerging opportunities in key areas, including electrification, autonomy, and mobility services and solutions, we are driving future growth potential and responding to transportation challenges faced by cities across the globe.

Emerging Opportunities



Electrification

Become a top player in electrified solutions



Autonomy

Lead development and application of fully autonomous vehicle technology and businesses

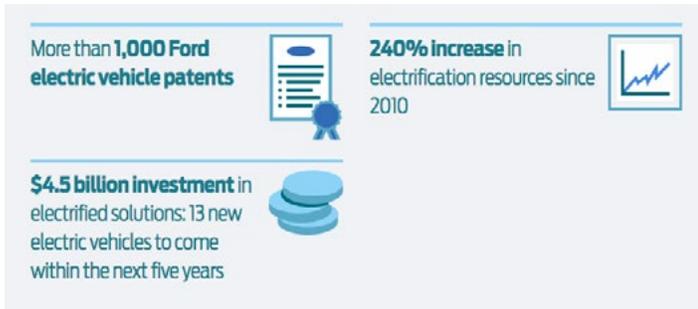


Mobility

Develop services and business models

WHAT WE'VE DONE AND WHERE WE'RE HEADING

Electrification: Building From a Strong Base and Investing to Remain a Top Player



Ford is already a top player in U.S. electrification; our C-MAX and our Fusion Energi hybrids made Ford the best-selling brand of plug-in hybrids and we have sold 500,000 electric vehicles.

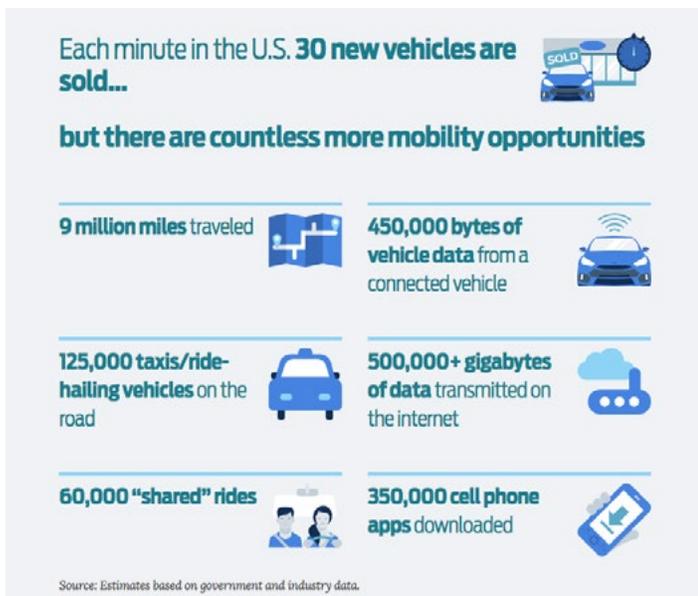
> [Read more about electrification in the Customers and Products section](#)

Autonomy: Marrying Our AV Technology Expertise With Our Proven Ability to Commercialize at Scale

- Ford has been a leading player in autonomous vehicle (AV) technology development for more than 10 years
- We plan to launch a Society of Automotive Engineers (SAE) Level 4¹ autonomous vehicle for mobility services
- We're testing Level 4 AVs with safety drivers on the road right now

Mobility: Offering Value to Customers and Cities

As we move from our traditional sales business to a holistic mobility system, there are significant opportunities for participating in far more transactions in order to offer unique value to customers:



- We're focusing on two business models – owned and shared, which will provide transportation for passengers and goods
- We have insights into mobility challenges and possibilities from more than 30 global mobility experiments
- We have established a City Solutions team and are collaborating with the Bloomberg Philanthropies and a coalition of city mayors worldwide to incubate ideas and accelerate solutions

DATA AND ANALYTICS

New Common Data and Analytics Platforms Are Underpinning Emerging Opportunities

- Data and analytics have a central role in supporting customers with mobility products and services, and in extracting value from data
- We have an efficient foundation of common and scalable platforms and tools, enabling us to accelerate past basic customer insights and transform the future customer experience
- Our focus is on anticipating needs and developing new services that solve everyday problems – see the summary of FordPass developments below.

Customer Privacy and Security: Our Paramount Responsibility

Ford recognizes the paramount importance of protecting information entrusted to us and we have established policies and procedures to ensure customer choice, privacy and responsible data handling.

FordPass – Transforming the Customer Experience

FordPass is a core part of our business model expansion to be both an auto and mobility company. Through FordPass we are focused on taking the consumer experience to the next level and transforming how consumers interact with Ford.

- The **FordPass app** is designed to meet mobility needs “on the move” – from finding, reserving and paying for a parking spot downtown before leaving home to easy booking of service appointments and even a convenient way to connect with roadside assistance
- **Marketplace** – access via the FordPass app to both owner and mobility services and partners
- **Appreciation** – FordPass “perks” connect us with customers in new ways and reward members for engaging with Ford
- **Ford Guides** – real people who provide the human touch in a digital world, helping members with any FordPass-related questions or needs
- **FordHub** – a brand experience studio focusing on education, entertainment and collaboration, providing interactive experiences and activations, and creating a two-way dialogue with consumers

Year One Developments and Learning

Year one of FordPass has focused on launching and learning. Since April 2016:

- We launched FordPass and “The Lincoln Way” – a similar app that features many of the standard FordPass features, such as the ability to remotely access and start your vehicle
- More than 650,000 members globally have joined
- There have been nearly 30 releases of the FordPass app across six countries and six languages, offering features and services that connect people’s daily activities with vehicles and a range of exciting mobility options
- Ford Guides support the FordPass vision of a “personal assistant for mobility needs.” In the U.S., we have had more than 50,000 contacts to our Guides since we launched. Today, we have a global Guide footprint, with three locations covering every time zone around the world
- We opened our first FordHub, in New York City, where consumers can enjoy immersive experiences and interact with our team of Guides in person. We continue to learn and evaluate from our New York Hub as part of formulating any future plans

Continuing the FordPass Journey

We have continued to add new and enhanced functionality to the FordPass app and services over the year. Since launching in the U.S. in April 2016 and in Canada in June 2016, FordPass members can now find a parking spot more easily, with the added ability to make reservations as well as see parking garages. Also in the U.S., we are partnering with San Francisco-based Chariot to develop dynamic shuttle services. Going forward, it is our intent to enable users to access Chariot through the FordPass app.

In China, we launched FordPass in November 2016. Our members in China now have access to a FordPass WeChat channel, where followers can keep up to date with FordPass news and chat with Ford Guides.

In Europe, we launched FordPass in Germany and the U.K. in September 2016 and in France in November 2016. In Germany, we partner with Deutsche Bahn Connect's Flinkster to offer FordPass members 24/7 access to nationwide car sharing.

Over time we will continue to provide members with access to more mobility services that add value to daily lives.

Mobility Services for Underserved Communities

The Better World Learning Community (BWLC) is a multi-sector collaboration initiative integrating mobility and connectivity into existing programs through partnerships with owner/operator NGOs, businesses, governments, community groups and international organizations to deliver Sustainable Development Goals (SDG) services using Ford Motor Company vehicles.

The vehicles – called flexible response vehicles (FRVs) – are equipped with technologies enabling delivery of a suite of bundled services including health care, water, education, power and more to be delivered to underserved communities.

1. Autonomous, with driver not required; geo-fenced (mapped areas, e.g., city environments that enable AV).

Governance

High standards of governance are key to maintaining the trust of investors and all stakeholders. Importantly, all sustainability-related structures, processes and management systems are integrated, ensuring that our business operates in a transparent and accountable way.

Corporate Governance

Ford's Board of Directors is guided by our Corporate Governance Principles, Code of Ethics and charters for each Board Committee, all of which are publicly available in the [Corporate Governance section](#) of our corporate website.

› [Read more about Corporate Governance in our Annual 10-K report](#)

Sustainability Governance

We follow our Creating Value Roadmap (CVR) to continually improve our performance and deliver on our One Ford plan. We use a variety of governance systems and processes to manage the different aspects of sustainability across our business. These are summarized throughout this report.

In addition to ensuring that we act responsibly in the interests of our shareholders, we must also have accountability for our wider impact on the world around us.

Board Committees

Sustainability and Innovation Committee

- Primary responsibility for reviewing strategic sustainability issues
- Evaluates and advises on innovations that improve our environmental and social sustainability, and the strategies to bring them to market

Other Board Committees include Audit, Compensation, Nominating and Governance, and Finance.

Executive Management

Group Vice President of Sustainability, Environment and Safety Engineering (SESE)

- Primary responsibility for sustainability issues
 - Oversees the Sustainability & Vehicle Environmental Matters group, the Environmental Quality Office, the Vehicle Homologation & Compliance group and the Automotive Safety Office
 - Leads a multidisciplinary senior-level team to oversee our actions in response to our climate change and sustainable mobility strategies
- Other executive and group vice presidents across our functional areas also have responsibility for sustainability-related issues.

Function Areas

Sustainability and Vehicle Environmental Matters

- Coordinates our companywide sustainability strategy and activities
- Leads our sustainability reporting and stakeholder engagement
- Collaborates with other functional areas and skill teams to integrate sustainability throughout the company

› [For further information, download our Corporate Governance Principles, 2016 Proxy Statement and Code of Ethics](#)

Key Business Processes

We have a number of key governance processes that enable us to manage issues that cut across functional areas.

Creating Value Roadmap

The CVR process is the model for how we run the company. It contains the management processes that we follow to continually improve our performance and deliver our One Ford plan.

Fully integrated into how we run the business, it enables us to continually monitor the ever-changing global business environment for risks and opportunities – including those related to sustainability – and use this analysis to inform and adjust our strategies as needed. It also creates stronger accountability for setting, tracking and reporting progress against our goals, objectives, revenue targets, and other financial indicators and stakeholder satisfaction. The CVR process is institutionalized as Policy Letter 25. This helps to ensure we implement sustainability-related risk assessments, planning, strategy implementation and performance reviews consistently around the world.

We monitor progress against objectives throughout the year, using the processes set out below. These allow us to respond to new internal and external developments in a timely manner and use these evaluations to inform adjustments to our management approaches where necessary.

- **Business Plan Review (BPR):** The senior leadership team (representing all skill teams and business units) hold weekly BPR meetings to review our management of sustainability and other business issues. Ford's sustainability scorecard is reviewed alongside our business units' scorecards at these meetings
- **Special Attention Review (SAR):** 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 more specific risks and opportunities
- **Additional governance forums:** Other forums, including the Strategic Programming Meeting, Product Matters Meeting, Quality and Productivity Meeting, and Executive Personnel Committee, enable us to review key elements of our business, make long-term decisions and develop strategic inputs to the Board of Directors

Business Plan Development and Compensation

As part of our annual business planning process, Ford's business units develop scorecards to track their performance. Sustainability targets are integral to companywide achievements and are translated into product manufacturing and financial performance metrics. These metrics form part of the performance assessment for 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.

Ethics and Compliance

As our company grows, we need to ensure that ethics and compliance remain the foundation of all our business practices around the world. Building on our brand promise, we developed an internal communication campaign to Go Further – The Right Way.

Ethics Advice at Our Fingertips

To help our employees do things the right way, we seek to provide them with the information they need, when and where they need it. To help us deliver on this promise, our Corporate Compliance Office is developing innovative training and communication tools that make compliance with corporate policy and the law as easy as possible.

One of these tools is a free mobile application, The Right Way, (pictured) which puts key compliance information at our employees' fingertips. It provides answers to frequently asked questions, covering topics such as our human rights commitment, the signs of human trafficking, our stance against harassment and discrimination, and our strict policy against [bribery and corruption](#). It also enables our people to contact the Compliance Office directly.

To make this new tool accessible and easy to use across our global workforce, it is now available in seven languages. It is also publicly available so that our suppliers and other business partners can use it to become more familiar with our ethical policies and practices.

We are also making the entire app – including the architecture and content – available as “open source” material for other companies and groups to build on.

Corporate Compliance Office

Our Corporate Compliance Office promotes a culture of compliance and ethics across our business. As part of Ford's Office of the General Counsel, it works with many other areas in the company to translate our aspirations and high standards – formalized in company policies and reinforced by management – into action. Senior management and the Board of Directors' Audit Committee oversee our compliance program.

Ethics and Compliance Training

Our Policy Letters and Directives formally establish expectations for our employees and others working on our behalf. The most important and relevant of these are incorporated into our [Code of Conduct Handbook](#). Available in 14 languages, this is our primary ethical guidance document.

To reinforce our compliance program, we run mandatory online training courses for our global non-manufacturing employees and other key personnel. The courses focus on risk areas such as bribery and corruption, conflicts of interest, [protecting personal and company information, and Ford's ethical culture](#).

We strive to offer materials that are useful, engaging and available when needed, and we're continuously improving our online training courses to provide shorter, more frequent and more memorable training modules. For example, in an upcoming training course, we are teaming up with a professor from Harvard Business School to give a TED-Talk-style presentation about why good people sometimes engage in bad behavior. This will provide inspiring insight into how we can maintain our ethical culture at Ford.

Reporting Violations

Our compliance program encourages and facilitates the reporting of known or potential violations of the law, or our Policy Letters and Directives. Individuals can anonymously report such violations to the General Auditors' Office, Human Resources or the Office of the General Counsel, using telephone hotlines or via email. A cross-functional committee reviews all allegations, oversees any investigations, and implements corrective or disciplinary actions.

Anti-Bribery and Anti-Corruption

Although our many facilities around the world need to comply with a wide range of national laws and governmental enforcement practices, it's essential that we maintain the highest standards wherever we operate. To ensure that we don't accept local norms if they fall below our own standards, we have:

- Crafted clear bribery and corruption policies, and provided procedures for reporting breaches of law or policy
- Strengthened the anti-bribery and anti-corruption elements of our Global Terms & Conditions (and other contracts) for our suppliers
- Continued to train individuals who may encounter bribery or corruption issues in their work
- Assessed all our operations for risks related to bribery and corruption

CASE STUDY

Ford Named One of World's Most Ethical Companies®



As business ethics increasingly affect customers and their purchase decisions, we were proud to be named to the 2017 World's Most Ethical Companies® list by the Ethisphere Institute in March 2017. Ethisphere Institute rates companies across five categories: ethics and compliance, corporate citizenship and responsibilities, culture of ethics, governance and leadership, and reputation.

Ford Motor Company is proud to be among the **World's Most Ethical Companies**

This marks the eighth consecutive year that we have received the accolade. The honor is a reflection of Ford's core values, and demonstrates to our customers what we stand for as a company.

In addition, we have been recognized by several other third-party organizations for our efforts during 2016. *Forbes* named Ford to its [The Just 100: America's Best Corporate Citizens](#) and [2016 America's Best Employer](#) lists, and we scored 100 percent on the Human Rights Campaign's Corporate Equality Index.

Policy Letters and Directives

At Ford, Policy Letters establish a framework of broad, basic principles within which we conduct our business globally, while Corporate Directives provide more in-depth information on narrower topics or only relate to particular segments of the business.

Many other business practices, handbooks, guidelines and business standards are used to govern the conduct of our people around the world. The following corporate standards have a particular relevance to sustainability.

Anti-Bribery and Anti-Corruption

We never pay bribes nor allow others to pay bribes for us, and we comply fully with the laws of each country where we do business. Our personnel are directed to report any requests or solicitations for improper payments through our companywide reporting systems. We also have ethical standards to limit the types of entertainment, gifts and favors that our workers can give and accept.

Diversity and Inclusion

We are committed to equal opportunity in all aspects of our business. We also recognize that a diverse workforce is a valuable asset, and we strive to provide an inclusive work environment where different ideas, perspectives and beliefs are respected and encouraged.

Our Policy Letter and Directives relating to [diversity and inclusion](#) address equal opportunity and prohibit disparate treatment because of race, religion, color, age, sex, national origin, disability, gender identity, sexual orientation, veteran status and other factors that may be covered by local law.

Health, Safety and the Environment

The protection of health, safety and the environment is a companywide responsibility of everyone at Ford. Our policies highlight the importance of sustainable economic development for Ford and for society in general. Our products, services, processes and facilities are periodically reviewed against objectives and targets that are designed to [minimize waste and pollution from our operations](#), as well as those of [our suppliers](#), and any adverse impact on workers' [health and safety](#).

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. This outlines our commitments on key human and labor rights issues such as working hours, child labor, forced labor, human trafficking, health and safety, harassment and discrimination, and freedom of association. It also:

- Articulates our commitment to be a good corporate citizen and implement policies and programs to benefit the communities where we operate
- Encourages [suppliers](#) to adopt and enforce similar policies for their own suppliers and subcontractors

Political Contributions

Ford's Policy Letter on governmental relationships covers issues relating to public policy and political contributions. See Public Policy for more detail.

Privacy

The trust and confidence of our customers and employees are essential to building long-term relationships and delivering excellent products and services. We recognize that customers, employees and others have concerns about [data privacy and security](#), and expect us to protect and handle personal information responsibly. We are committed to implementing responsible privacy and data-handling practices, and our relevant Policy Letters and Directives are designed to ensure continuing trust and confidence.

Product Quality and Customer Safety

Ford has a number of policy statements aimed at increasing the quality of our products and promoting the safety of our customers. Our quality policy, Policy Letter 1, forms the foundation, and stresses the importance

of quality in everything we do, noting that the customer defines quality. Additionally, collaboration between employees, suppliers and dealers is vital to sustaining and improving the [quality of our products](#).

At its core lie our Quality Operating System (QOS) and our use of key metrics to make data-driven decisions. This process includes real-world safety data, driver behavior considerations, road infrastructure and environmental factors, regulatory safety requirements and voluntary industry agreements.

Vehicle safety is a fundamental aspect of Ford's QOS. The foundation of our corporate safety policy, Policy Letter 7, outlines our commitment to design and build vehicles that meet or exceed applicable laws and regulations, while meeting the safety needs and expectations of our customers. In line with our Policy Letter, Ford is continuously working to enhance the [safety of our products](#).

Social Media Interactions

We encourage responsible employee participation in social media – such as Facebook, Twitter and Instagram, as well as blogs and online discussion forums – and have developed [digital participation guidelines](#). We also use online resources to educate our workforce about the use of social media and the need to communicate honestly and respectfully in connection with our business.

Suppliers

Our work with Supplier Partners is governed by our Global Terms & Conditions, and by Policy Letter 24: Ford Code of Human Rights, Basic Working Conditions and Corporate Responsibility. This policy addresses workplace issues such as working hours, child labor, forced labor, non-discrimination, freedom of association, health and safety, and the environment. It applies to our own operations but we also encourage businesses throughout our supply chain to adopt similar policies in their own operations. This policy is supplemented by web-guides on a range of specific topics.

Public Policy

Every day, government officials around the world make decisions that impact our business. As a global company, it is important that we have a voice in policies that affect our business in the countries where we operate, and that we continue to be recognized as a credible source of information to help shape those policies.

Supporting 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. Across a range of issues, we strive to be part of the solution, supporting international, national, regional and local policies that are economically, environmentally and socially sustainable for our company, our customers and their communities.

On issues of the highest priority, we maintain regular dialogue with legislators and regulatory officials in our major markets, sharing our expertise and adding our perspective to the policy-making process. Our Government Affairs offices around the world oversee these lobbying activities.

Advocacy Through Coalitions and Associations

We belong to a broad range of partnerships, coalitions, industry groups and trade associations that advocate for legislation and regulation on behalf of their members. Working with others through such organizations enables us to better leverage our resources on important issues, and to develop and promote policies that could have far-reaching benefits for our company, our industry and society as a whole.

Of course, we don't always agree with every position taken by these organizations. In such cases, we always reserve the right to speak with our own voice and make our own stance clear, even if our views don't align with the positions of the associations to which we belong.

› [Read about the work of our Political Action Committee \(PAC\)](#)

Human Rights and Working Conditions

Ford was the first automaker to recognize that protecting human rights in our operations and our supply chain is an important sustainability issue, and we remain committed to respecting human rights everywhere that we operate. Our human rights and working conditions program is an integral part of our efforts to develop a more sustainable and ethical supply chain.

Our Approach to Safeguarding Human Rights

We aim to ensure that everything we make – or that others make for us – is consistent with local law and our own commitment to protecting human rights.

This commitment, in our own operations and in those of our suppliers, is embodied in our [Policy Letter 24: Ford Code of Human Rights, Basic Working Conditions and Corporate Responsibility](#). This code is based on internationally recognized labor standards, including the United Nations' Guiding Principles on Business and Human Rights; Universal Declaration of Human Rights; International Labour Organization Covenants; the Organisation for Economic Co-operation and Development's Guidelines for Multinational Enterprises; and the United Nations' Global Compact Principles.

Policy Letter 24 outlines our commitments on key human and labor rights issues such as working hours, child labor and forced labor, human trafficking, health and safety, harassment and discrimination, and freedom of association. It also:

- Articulates our commitment to be a good corporate citizen and how we work to implement policies and programs to benefit the communities in which we operate
- Encourages suppliers to adopt and enforce similar policies for their own suppliers and subcontractors

This commitment requires a robust approach to safeguarding against human rights abuses in our supply chain. This approach includes:

- Analyzing the risks related to human rights and working conditions associated with our supply base on a regular basis (see below)
- [Conducting training](#) and working to build our suppliers' capability
- [Auditing our Tier 1 suppliers](#) in high-priority locations to ensure their continued compliance with legal requirements and Ford's standards
- [Collaborating with others](#) in multi-stakeholder initiatives and partnerships to drive positive change throughout the automotive industry

See our [United Nations' Guiding Principles Reporting Framework page](#) for further detail on how we're meeting our responsibility to respect human rights.

› [Find out more about how we're helping suppliers manage their environmental impacts](#)

Prioritizing Our Efforts

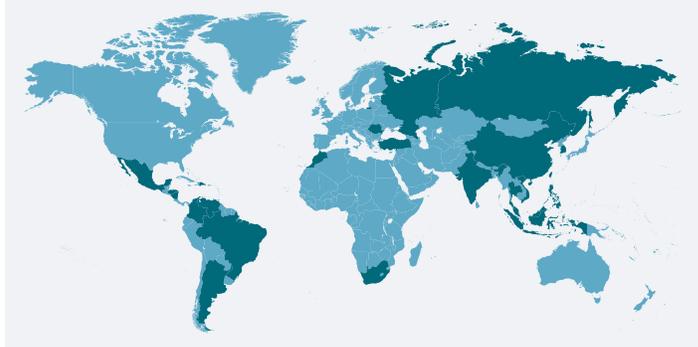
Due to the size and reach of our global supply base, we focus our efforts on suppliers located in countries that pose the highest risk for substandard working conditions.

To determine those priority locations, we conduct an annual risk analysis, incorporating internal and external data, and input from external stakeholders. The internal data includes information such as

the commodities being purchased and the supplier's location, annual spend, and training and audit history within Ford's Supply Chain Sustainability program. As a result of this analysis, our list of 22 high-priority countries remained unchanged in 2016 (see map below).

In addition, our Purchasing Supplier Technical Assistance (STA) representatives are trained to identify and report potential warning indicators for human rights violations in any supplier location around the world. As a result, when individual circumstances arise, we routinely work with suppliers outside these locations to ensure that our expectations continue to be met.

Human Rights and Working Conditions Program: Priority Countries



Americas: Argentina, Brazil, Colombia, Dominican Republic, Honduras, Mexico, Nicaragua, Venezuela

Asia: China, India, Indonesia, Malaysia, the Philippines, South Korea, Taiwan, Thailand, Vietnam

Europe, Middle East and Africa: Morocco, Romania, Russia, South Africa, Turkey

CASE STUDY

Ethical Recruiting

In 2016, we reviewed our internal policies and procedures to ensure they aligned with the fundamental tenets of ethical recruiting. We require that Ford employees and their agents shall not:

- Destroy, conceal, confiscate or otherwise deny access by an employee to the employee's identity or immigration documents, such as passports or driver's licenses, regardless of issuing authority
- Use misleading or fraudulent practices during the recruitment of employees or offering of employment
- Charge employees recruitment fees

Our review of our operations resulted in no significant findings in our own facilities. Our 2017 Supplier Social Responsibility and Anti-Corruption Requirements Web-Guide will include similar expectations of our suppliers.

In 2016, all our supplier audits included a review of ethical recruiting standards. We found 16 non-conformances related to ethical recruiting expectations, and are working with the suppliers to implement corrective actions to resolve these issues.

› [Read more about employee attraction and retention and see the "No Fees" initiative from the Interfaith Center on Corporate Responsibility \(ICCR\) for more information on ethical recruiting](#)

Taking the Lead on Forced Labor and Human Trafficking

In line with our zero-tolerance policy toward both forced labor and child labor, we have taken a number of actions to safeguard against the threat of these issues in our supply chain. These include maintaining compliance with all applicable legislative initiatives, acts and regulations designed to increase supply chain transparency. These legislative initiatives include the California Transparency in Supply Chains Act of 2010 (SB 657); the U.K. Modern Slavery Act (UK-MSA); and the Federal Acquisition Regulation (52.222-50, Combating Trafficking in Persons).

For further information about the steps we are taking toward leadership in the field of human rights and working conditions, download our [Human Trafficking Disclosure Statement](#) and read our disclosure statement on [compliance with the U.K. Modern Slavery Act](#).

Supplier Training and Education

Training on human rights issues is essential to help our suppliers build their capability to responsibly manage working conditions in their facilities.

How We Build Capability

Ford's training approach, developed and launched through the Automotive Industry Action Group (AIAG), involves the following aspects:

- An e-learning module to introduce the concepts covered by the [AIAG Guiding Principles](#), and a knowledge assessment designed to provide feedback. Training materials are available free of charge to original equipment manufacturers (OEMs) and sub-tier suppliers in seven languages. Materials have been shared with the European Automotive Working Group to ensure a consistent message across the industry.
- In addition, face-to-face in-country workshop sessions focus on specific national laws and local best practice, and encourage dialogue with suppliers for multiple OEMs. These are customized to suit the unique conditions in each country, and emphasize the role of human rights in meeting legal obligations, industry guidelines and international best practice. Participants are required to verify that they have shared the information with their employees and their own direct suppliers.

Most of our face-to-face supplier training is delivered through the AIAG or the European Automotive Working Group. These materials also serve as the basis for our own Ford-specific workshops.

- > [Read more about our partnerships and collaborations](#)
- > [Find out more about how we're helping suppliers manage their environmental impacts](#)

Training Results

In 2016, the AIAG e-learning module reached 2,004 participants, with 942 indicating Ford as a customer. During the year, supplier representatives from 161 direct and indirect supplier sites in five countries (Argentina, China, Czech Republic, India and Mexico) attended in-country training sessions covering human rights, working conditions, business ethics and the environment.

Training Data

	2014	2015	2016	Program Total ¹
Training sessions conducted	7	12	14	175
Total sites trained/retrained	280	208	161	3,302

Data notes and analysis:

1. Program Total represents cumulative data from 2003 to 2016.

In 2017, we plan to host face-to-face training sessions in Brazil, India and Turkey, as well as increase the penetration of the AIAG e-learning module and knowledge assessment with our suppliers in Mexico.

Internal Supply Chain Sustainability Training

We also continue to strengthen our own internal capability for managing human rights. In 2016, we trained 1,153 Ford Purchasing employees, including management and supplier quality teams, on our [Policy Letter 24](#) and Supply Chain Sustainability program, which includes identifying and reporting key warning indicators.

Since 2014, we have trained or retrained 2,450 Supplier Technical Assistance (STA) personnel, and training on our Supply Chain Sustainability program will be required in 2017.

- > [Examine our training and assessment data in more detail](#)

Auditing Our Suppliers

Third-party social responsibility audits provide suppliers with feedback about how well they are meeting both legal requirements and Ford's expectations. They also help identify specific areas for improvement.

A New Protocol

In 2016, Ford became the first automaker to join the Electronic Industry Citizenship Coalition (EICC) and we began using the EICC audit protocol for our social audits. During the year, we conducted 31 new audits using the EICC methodology. Audits are generally announced and agreed with the supplier in advance.

The audit comprises 90 questions, covering health and safety, labor issues, management systems, ethics and – for the first time – the environment.

- > [Read more about our membership of the EICC and the EICC audit process](#)

Third-Party Social Responsibility Audits: Assessment Results

	2014	2015	2016	Total to Date ¹
Initial assessments	75	81	35 ²	1,106
Follow-up assessments	53	120	154	1,386

Data notes and analysis:

1. Program Total represents cumulative data from 2003 to 2015.
2. 31 of these assessments used the new EICC methodology.

Taking Corrective Action

For most issues identified during an audit, the supplier is required to prepare immediate containment plans and longer-term corrective action plans, which Ford reviews and monitors. Regular reviews help ensure ongoing compliance with the agreed plan.

The most common noncompliances that were identified related to:

- **Working hours:** Inadequate time off, and inadequate policies and systems to record and manage working hours
- **Child labor:** Inadequate systems and policies to prevent the use of underage workers, either directly or indirectly through labor agencies and contractors
- **Performance management:** The effective management of labor, health and safety, environment and ethics issues
- **Health and safety:** The effective maintenance of emergency exits, conducting fire and emergency evacuation drills, and appropriate record-keeping

Approximately 5 percent of the non-conformances uncovered required immediate containment actions. Of these:

- 40 percent were attributable to working hours and consecutive days of work
- 30 percent were health and safety issues
- and the remaining non-conformances were attributable to improper payment of wages or social insurance, and actions that, if not resolved, could be viewed as discriminatory

Should a supplier be unable or unwilling to address certain audit findings within our expected timeframe, we first engage with our regional and global purchasing communities to attempt to resolve the issue. However, we reserve the right to end our relationship with any supplier that fails to comply with our Global Terms, which include compliance with local laws, or fails to address an agreed compliance plan within an agreed timeframe.

- › [Examine our training and assessment data in more detail](#)
- › [Find out more about how we're helping suppliers manage their environmental impacts](#)

Partnerships and Collaboration

Ford participates in multi-sector initiatives to explore ways to strengthen our supply chain and combat human rights violations. We believe that sector-wide forums are also vital for providing a common voice and for driving change within our industry.

How We're Working With Others

We currently participate in the following organizations and initiatives:

- **Automotive Industry Action Group (AIAG):** Ford co-chairs the AIAG's Working Conditions Oversight Committee, which works to increase supplier capability for managing human rights and working conditions in the sector. We are also engaging with its Sustainability Supplier Self-Assessment Work Group to create a standardized tool for automotive supplier sustainability gap analysis.
 - **European Automotive Working Group:** Ford actively participates in the European Working Group on Supply Chain Sustainability facilitated by CSR Europe.
 - **United Nations Global Compact (UNGC):** Ford is a signatory of the [UNGC](#), 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. Ford actively participates in the UNGC Supply Chain Sustainability Advisory Committee.
 - **Electronic Industry Citizenship Coalition (EICC):** Ford was the first automotive manufacturer to join the EICC, a nonprofit organization committed to improving social, environmental and ethical conditions in global supply chains. Working with more than 110 electronics companies, some of which are Ford suppliers, we will be able to strengthen our engagement with our suppliers on issues such as human rights, working conditions, ethical sourcing and environmental responsibility. Ford is currently serving on the EICC Board of Directors.
 - We have also committed to the [AIAG Corporate Responsibility Guiding Principles](#) and the [European Automotive Workgroup Guiding Principles](#) to enhance sustainability performance throughout the automotive supply chain.
- › [Find out more about how we're helping suppliers manage their environmental impacts](#)

Conflict Minerals

The U.S. conflict minerals legislation is designed to reduce funding to armed groups benefiting from mineral trade in the Democratic Republic of the Congo (DRC) or adjoining countries. Ford is required to investigate the origin of the conflict minerals in our products. Our goal is to use only conflict-free sources of tin, tungsten, tantalum and gold. We file an annual report disclosing the status of conflict minerals in our products.

What Are Conflict Minerals?

Tin, tungsten, tantalum and gold (3TG) are used in many auto parts and components, from engine assemblies to airbags. We work tirelessly to ensure the minerals we use in our vehicles are DRC conflict-free, and continue to support responsible mineral sourcing in the DRC and adjoining countries.

3TG:

Tin, tungsten, tantalum and gold

Conflict minerals:

Gold, as well as columbite-tantalite (coltan), cassiterite, wolframite or their derivatives, which are limited to tantalum, tin and tungsten

Disclosure and Reporting

In August 2012, the U.S. Securities and Exchange Commission (SEC) adopted the final rule to implement reporting and disclosure requirements concerning conflict minerals. Since 2014, under the US Dodd-Frank Act 2010,¹ public companies have been required to conduct due diligence to determine the origin of the conflict minerals in their products and report annually to the SEC in the hope of ending violent conflict in the DRC and adjoining countries.

We are one of several automotive manufacturers obliged to report on conflict minerals in our supply chains in a Specialized Disclosure report, filed annually with the SEC. Our 2016 Conflict Minerals Report received a "strong" rating from Responsible Sourcing Network.

To enable compliance with this disclosure rule, suppliers that provide us with components containing 3TG are expected to conduct due diligence to understand the origins of such minerals, source them responsibly and not knowingly provide parts containing minerals that may contribute to conflict. They are also encouraged to use validated, DRC conflict-free smelters and refiners for the 3TG purchased for use in Ford products. We encourage them to use the [Due Diligence Guidance](#) compiled by the Organisation for Economic Co-operation and Development (OECD) to assess the chain of custody of these minerals.

Reporting Progress

Suppliers are required to submit an annual Conflict Minerals Reporting Template (CMRT) to Ford. For the past two years, we met our goal to achieve a 100 percent response rate from in-scope suppliers.

In 2017, we will continue to work with our suppliers to improve the quality of their reports.

- › [Read our 2016 Conflict Minerals Disclosure filing, and download our Conflict Minerals Policy for more information](#)

Industry and Cross-Industry Leadership

Our leadership position among our industry peers, across other sectors and in multi-stakeholder initiatives extends to developing solutions and sharing best practices to ensure responsible sourcing in our supply chain.

Our memberships and leadership positions include the following:

- [Automotive Industry Action Group \(AIAG\)](#) – Ford’s active role on the Smelter Engagement and Best Practices teams supports the development of processes and tools to educate suppliers and improve supply chain reporting transparency

In recognition of our efforts, Ford was ranked 14th in the **Top 100 Conflict Minerals Influence Leaders** by Assent in 2016.

- [Conflict-Free Sourcing Initiative \(CFSI\)](#) – Ford is a member of the CFSI Steering Committee and one of more than 300 CFSI members participating in cross-industry smelter engagement including smelter visits and other initiatives to encourage smelter participation in the [Conflict-Free Smelter Program](#). In addition, Ford is an active participant in the CFSI Multi-Stakeholder Group and the CFSI Due Diligence Practice team
- [Public-Private Alliance for Responsible Minerals Trade \(PPA\)](#) – Ford serves on the PPA’s Governance Committee contributing to regional solutions for certified conflict-free minerals

Future Goals

As we continue on our conflict minerals journey, we have set the following goals:

- 100 percent response rate from in-scope suppliers for annual reporting
- Year-over-year improvement in the percentage of suppliers providing smelter lists
- Year-over-year improvement in the percentage of suppliers using CFSI-compliant conflict-free smelters
- Participate in smelter outreach efforts to encourage participation in the CFSI audit process

1. Specifically, Section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010.



Our Value Chain and Impacts

To create value and reduce our footprint, we need to assess and manage impacts across the life cycle.

Summary of Our Value Chain



Product Design

Material Issues

- Addressing impacts at every stage of the automotive life cycle, from the use of natural resources and materials to product quality and safety

Value Creation

- Innovation in engineering, design and tech to provide solutions to specific mobility, social and environmental challenges



Raw Material Extraction

Material Issues

- Human rights/conflict minerals

Value Creation

- Supply chain management



Logistics/Transportation

Material Issues

- Fuel use and transport emissions

Value Creation

- Supply chain management



Supply Chain Parts Manufacturing

Material Issues

- Use of materials
- Waste

Value Creation

- Supply chain management



Ford Manufacturing

Material Issues

- GHG emissions, water, waste, materials
- Community impacts

Value Creation

- Lean process innovations
- Socio-economic contribution



Sales and Service

Material Issues

- Social and environmental responsibility

Value Creation

- Local employment
- Recycling of used parts



Our Vehicles in Use

Material Issues

- Product carbon footprint
- Air quality and congestion

Value Creation

- Affordable fuel economy, sustainable materials, etc.
- Mobility solutions for tomorrow’s cities



End of Vehicle Life

Material Issues

- Waste materials/landfill

Value Creation

- Closed-loop processes
- Recovery, reuse and recycling

Greenhouse Gas Emissions in the Vehicle Life Cycle

Greenhouse gases (GHGs) emitted by our vehicles on the road are by far the biggest part of our footprint and are generally determined by factors outside our control. These include our overall sales mix in any given year and, just as significantly, how our vehicles are driven. It is only possible to estimate emissions from the use phase, but in terms of facility GHG emissions, we have an accurate understanding based on tracking our actual energy consumption and other data.

2016 GHG Emissions From Ford Operations and Use of Sold Products

	<i>Million metric tons</i>
Ford Facilities	4.6 ¹
Use of Sold Products	130.9 ²

Data notes and analysis:

- Direct emissions, including those arising from our electricity production, and indirect emissions from purchased electricity, steam and heat.
- Emissions over 150,000 km for all passenger cars and other light-duty vehicles sold during the reporting year in the United States, Canada, Mexico, E.U., China, Australia, Brazil and India. Based on 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.

GHG Footprint in Context

All main types of transportation together totaled around 23 percent of GHG emissions globally in 2014 (IEA, 2016, CO₂ Emissions from Fuel Combustion Highlights 2016). Passenger cars and light-duty trucks, Ford's primary products, made up about half of the 2013 total transportation GHG emissions on a well-to-wheels basis (IEA, Energy Technology Perspectives 2016. ETP2064 transport summary online data).

CO₂ makes up the vast majority of GHG emissions produced by our operations and products. However, we are also working to understand and reduce non-CO₂ GHG emissions such as HFCs, CH₄ and N₂O associated with our products.

Some GHG emissions we can control directly – for example, most of those from our own operations. However, our ability to influence and even measure decreases the further up and down our value chain we look.

Water Use in the Vehicle Life Cycle

Global water challenges including availability and access are closely linked to climate change and human rights issues. We are addressing these in our facilities, supply chain and community engagement.

To better assess Ford's water footprint, we have estimated life cycle use for a model year 2012 Ford Focus – both the internal combustion engine vehicle (ICEV) and the battery electric vehicle (BEV).

Ford Focus 2012 – Estimated Life Cycle Water Use

	m ³ Life Cycle Water Withdrawal – Estimated U.S. Average	m ³ Life Cycle Water Consumption – Estimated U.S. Average
Ford Focus 2012 ICEV	530	130
Ford Focus 2012 BEV	3,770	170

Data notes and analysis:

Withdrawal is total water withdrawn that may or may not be returned to the source. Consumption is water withdrawn and not returned to the source.

The analysis includes water used in materials 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.

The Focus ICEV use-phase analysis assumes the typical U.S. gasoline, which includes 10 percent ethanol (E10). The Focus BEV use-phase analysis assumes the U.S. average electric grid mix.

There is a relatively large water withdrawal associated with the BEV use phase, which 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.

During the use phase the car itself does not consume a lot of water. Under a life cycle analysis, however, one could take the view that the use phase is the most water-intensive due to the water used to produce the gasoline or electricity that powers the vehicle. This highlights the importance of reducing the water consumption associated with fuel production, as well as increasing vehicle energy efficiency

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

For a fuller analysis, see H.C. Kim, T.J. Wallington, S.A. Mueller, B. Bras, T. Guldborg, and F. Tejada (2015). [Life Cycle Water Use of Ford Focus Gasoline and Ford Focus Electric Vehicles](#), *Journal of Industrial Ecology*, 20 (5), 1122-1133.

Prioritizing Key Issues

We use a formal materiality process to define our reporting priorities, identify emerging sustainability issues, shape our sustainability strategy, set goals and allocate resources. The resulting priority topics are captured in a matrix, providing a snapshot of the challenges, opportunities and connections between the sustainability issues of most importance to our business and of highest concern to our stakeholders.

Materiality Results

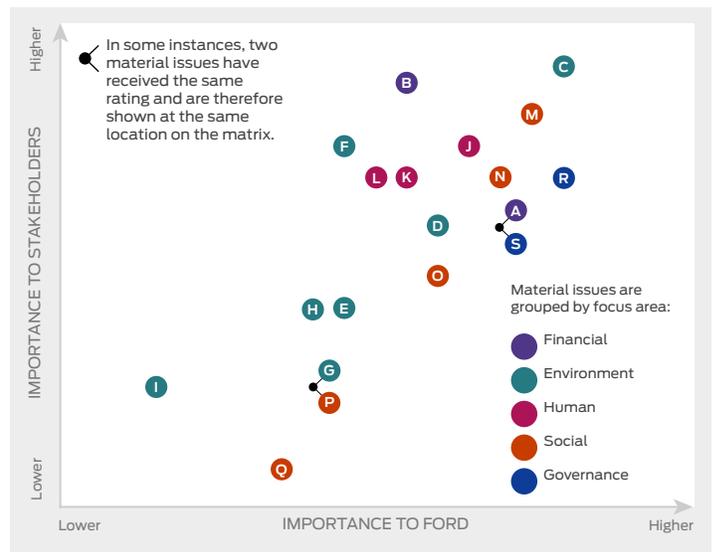
Our most recent materiality analysis, conducted in 2016 and early 2017, is reflected in the matrix on the next page.

Our most important issues were identified as being:

- Ethical business practices
- Product carbon footprint and fuel economy
- Customer satisfaction, product quality and safety
- Supply chain management, assessment, capacity building and performance
- Government regulation and policy

To enhance our two-dimensional matrix this year, we included an additional layer showing linkages between sustainability issues.

Our Materiality Matrix



- A** Financial health, intellectual property protection and brand perception
- B** Mobility, product and service innovation
- C** Product carbon footprint and fuel economy
- D** Air quality
- E** Operations and logistics energy use and GHG emissions
- F** Climate change resilience strategy and energy future
- G** Water use
- H** Sustainable materials and waste management
- I** Environmental management, process innovation and biodiversity
- J** Human rights
- K** Human capital
- L** Employee wellness, health and safety
- M** Supply chain management, assessment, capacity building and performance
- N** Customer satisfaction, product quality and safety
- O** Customer privacy, data protection and understanding consumer behavior
- P** Sustainable cities and infrastructure
- Q** Socio-economic contribution and community engagement
- R** Ethical business practices
- S** Government regulation and policy

Our materiality matrix plots each issue and the ratings accorded to it. The y-axis represents the importance to stakeholders and the x-axis represents increasing importance to Ford from left to right. Issues found closer to the upper right-hand corner of the matrix are of higher importance to Ford and stakeholders.

Summary of Major Changes

In our latest analysis, some new issues emerged and others dropped out. In an attempt to streamline our issues of focus, we also reorganized and streamlined our material issues, reducing them in number from 34 to 19.

- **Product carbon footprint and fuel economy** has increased in relative importance, becoming an issue of highest importance at the top-right of the matrix
- **Customer satisfaction, product quality and safety** has also increased in importance, also becoming an issue of highest importance
- Issues related to **government regulation and policy** (regulatory compliance, voluntary standards and certifications, fuel economy and GHG regulations, and other regulations/policy) have been grouped together at the top-right of the matrix
- **Human rights** was previously incorporated as part of human capital management, but it has emerged as a highly important issue in its own right, both within Ford and among stakeholders

› [Full Materiality Matrix](#)

Materiality Definitions and Methodology

We were an early adopter of materiality in the context of sustainability, having published our first analysis in our 2004/05 Sustainability Report. We have updated the assessment every other year, and our most recent analysis is reflected in this report.

Definitions of Materiality

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 Global Reporting Initiative (GRI) definition of material topics: "those that reflect the organization's significant economic, environmental and social impacts; or that substantively influence the assessments and decisions of stakeholders."

Our Materiality Process

Our most recent materiality analysis aligns with GRI Standards, and followed three key steps:

1. Identification

We drew up a list of potential issues, grouped by four different types of "capitals" – social, environmental, financial and human – and the topic of governance. The issues were identified through desk-based research, comprising a peer review, media scan and review of sustainability thought leadership from industry experts and associations.

2. Prioritization

Internal and external stakeholders were then invited to comment on the topics identified and rate them in terms of their perceived importance. Internal stakeholders were drawn from a wide range of functions across the business, while external stakeholders from the Ceres Stakeholder Committee included representatives of sustainability nongovernmental organizations, socially responsible investment organizations and industry peers. To read their feedback, see [About This Report](#).

The interviews were analyzed to identify key challenges, opportunities and linkages between the issues, and average ratings were obtained from both groups of stakeholders.

3. Review

The results of the materiality analysis were reviewed internally by Ford's Sustainability & Vehicle Environmental Matters (S&VEM) group and regional stakeholders.

Following the review, revisions were made to ensure that all feedback was appropriately reflected, and that our process and list of important issues were complete, well understood and inclusive of the perspectives obtained from stakeholders.

Stakeholder Engagement

Every day, at every level of the business, we engage with a large number of stakeholders, both formally and informally. These interactions are crucial to Ford, enabling us to respond effectively on sustainability challenges and opportunities affecting us all.

Key Stakeholders

Below, we have identified our key stakeholder groups and summarized the channels we use to maintain dialogue with them. For each group, the engagement varies on a case-by-case basis, and includes formal and informal channels that are used to varying degrees of regularity.



Communities

Operations in more than 100 countries worldwide

- Community Relations Committees
- Interactions with governments
- Membership of associations
- Dialogue with nongovernmental organizations
- Ford Fund
- Driving Skills for Life program



Customers

6.6 million vehicles sold

- Consumer Insight process
- Market research
- Customer care programs
- Dealer interactions
- Ford.com website
- Ford owners' magazine



Dealers

11,737 dealerships worldwide

- Intranet communications
- Brand sales and service representatives
- Brand Dealer Councils
- Dealer roundtables
- President's Circle
- Salute to Dealers
- Advertising and public service announcements
- Dealer Attitude Survey



Employees

201,287 employees across the globe

- Intranet site
- Sustainability Report and executive summary
- Social media applications
- Union representatives
- Joint labor-management committees
- Webcasts, videos, blogs and executive Q&A sessions with senior management
- “Town Hall” meetings
- Employee surveys
- Employee Resource Group initiatives
- Test drive and product reveal events



Investors

125,465 stockholders

- Investment community forums
- Quarterly earnings communications
- Annual shareholders' meeting
- Annual report
- Proxy statement
- SEC filings (e.g., 10-K, 10-Q, 8-K)
- Ratings and rankings



Suppliers

Total global spend of more than \$110 billion

- Top Supplier meetings
- Ford Partnership for A Cleaner Environment (PACE)
- Aligned Business Framework supplier dialogue sessions
- Supplier quality roundtables
- Supplier Diversity Development Networking
- External supplier organizations
- Coalitions including EICC

Engagement on This Report

Specific reviewers of the report include our Sustainability and Innovation Board Committee (who review our Executive Summary Report as part of their charter), the Global Executive Leadership team, global subject matter experts, the SE&SE Vice-President, Ceres, employees, sustainability think tanks and non-automotive corporations.

As part of the report preparation process, we specifically engage with a Ceres Stakeholder Committee to gain a multi-stakeholder perspective on sustainability topics. For further details of their feedback and our responses, see [About This Report](#).

Stakeholder Review of Report

For this Sustainability Report, as with our previous 10 reports, Ford agreed to work with a stakeholder team selected by Ceres to advise us. Ceres leads a national coalition of investors, environmental organizations and other public interest groups working with companies to address sustainability challenges.

About the Ceres Stakeholder Committee

The Ceres Stakeholder Committee, which was convened in March 2017, 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. Committee members provided feedback and recommendations associated with

Ford's assessment of the relative importance of financial, environmental, social and governance issues, and its sustainability performance and disclosure with respect to these issues.

As in previous dialogues, Ford was not expected to act upon all the stakeholder recommendations prior to publishing this Sustainability Report. Rather, stakeholders ask us to use these recommendations to help guide continuous, near-term progress toward achieving sustainability objectives.

Any aspects of these recommendations that were not responded to in this report will be included for consideration in our integrated sustainability workstream, considered for future action and reporting, and treated as an input to our materiality analysis process.

Response to Recommendations

Recommendation: Demonstrate leadership in responding to the climate challenge.

Ford response:

We continue to be committed to doing our share to stabilize the amount of CO₂ in the atmosphere, helping mitigate the progression of temperature rise. This is reflected in our strong focus on developing effective solutions through a multi-stakeholder, multi-sector approach, and on reducing climate-related impacts in our facilities and products. This includes our significant investment in electric vehicles and their associated infrastructure (see [Delivering Our Electrification Plans](#) and [Alternative Fuels and Powertrains](#)).

[The Climate Change Challenge](#) outlines Ford's long-standing and continuing commitment to climate stabilization, with further detail provided in [Our Climate Change Strategy](#).

Recommendation: Demonstrate leadership as a steward of human and natural resources.

Ford response:

This year, we have developed our reporting to incorporate the [UN Guiding Principles Reporting Framework](#) for the first time. We see this as the start of a journey; having met the minimum threshold in this initial effort to show how we respect human rights in practice, we are looking to answer more of the supporting questions and improve the quality of our responses over time.

In addition, we continue to communicate about Ford's work in multi-sector initiatives to strengthen our supply chain and combat human rights violations (see [Human Rights and Working Conditions](#)) and to promote diversity within our supply chain (see [Supplier Diversity](#)).

To further demonstrate our leadership efforts to act as a steward for natural resources, we help our key suppliers identify responsible environmental practices through our Partnership for A Cleaner Environment (PACE) program (see [Partnering for the Planet With Suppliers](#) and [Environmental Impact of Our Suppliers](#)); and to expand our use of recycled and renewable materials, including research partnerships exploring the viability of innovative new biomaterials (see [Using Sustainable Materials](#)).

Recommendation: Demonstrate leadership in sustainability strategy and disclosure.

Ford response:

Our sustainability strategy is focused on creating value for the business and broader society, and is integrated into how we operate, both strategically and on a day-to-day level. We use a formal materiality process to define and prioritize our key issues, most recently conducted in 2016 and early 2017. This year, we included an additional layer showing the relationships between sustainability issues in our latest [materiality matrix](#).

Recommendation: Enhance reporting to demonstrate a customer-centric approach to safety and security.

Ford response:

Safety continues to be one of the highest priorities in the design of our vehicles. We are committed to designing and manufacturing vehicles that achieve high levels of safety over a wide range of real-world conditions.

Our quality policy (Policy Letter 1) forms the foundation, and stresses the importance, of quality in everything we do, noting that “the customer defines quality.” And our corporate safety policy, Policy Letter 7, outlines our commitment to design and build vehicles that meet or exceed applicable laws and regulations, while meeting the safety needs and expectations of our customers. In line with our policy letters, Ford is continuously working to enhance the safety of our products, a fundamental aspect of our [Quality Operating System \(QOS\)](#).

Having become the first automaker to join the [Electronic Industry Citizenship Coalition \(EICC\)](#), we began using the EICC’s audit protocol for our social audits this year. We conducted 31 new audits using the new methodology, which covers health and safety, labor issues, management systems, ethics and the environment.

In addition, we are committed to respecting customer privacy, protecting their data and using it responsibly. We take our responsibilities extremely seriously and have established a companywide governance infrastructure to drive a holistic approach to the stewardship, privacy and security of the data entrusted to us. This includes having [policies and directives](#) in place to ensure the continuing confidence of those who entrust us with their personal information. We are also a founding member of the Auto-ISAC (Information Sharing and Analysis Center), which gathers, analyzes and shares information about cyber-related threats and vulnerabilities.

› [Read more about our wider stakeholder engagement activities](#)

About This Report

Welcome to Ford’s 18th 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.

This report covers the year 2016 and early 2017. The data is primarily for 2016 (for operations) and for the 2016 and 2017 model years (for vehicles). In addition to this full online sustainability report, we publish an eight-page review for use by employees, customers and other stakeholders.

Significant Leadership Changes Just Prior to Report Release

On May 22, 2017, Ford Motor Company announced major global leadership changes at the company:

- Jim Hackett was named as Ford Motor Company President and Chief Executive Officer, succeeding Mark Fields who is retiring

› [Read the full announcement](#)

- A number of additional global leadership team appointments were also announced

› [Read the full announcement](#)

These changes were announced during the final stages of preparing the 2016/2017 Sustainability Report, and are reflected in role titles, where appropriate, throughout the report.

Data Boundaries and Global Reporting Frameworks

Data in this report is subject to various forms of assurance, as discussed below and noted in the data tables. The summary report was reviewed by Ford’s top senior executives and the Sustainability and Innovation Committee of the Board of Directors.

This report is “in accordance” with the Global Reporting Initiative (GRI) Standards at a Comprehensive level. In 2016/17, Ford Motor Company transitioned to the GRI Standards. The GRI Standards include all the main concepts and disclosures from G4, with changes mostly involving structure and format. More information on the GRI Standards can be found on the [GRI website](#).

This report also serves as Ford’s annual United Nations Global Compact (UNGC) “Communication on Progress” (see the [UNGC Index](#)), as it includes discussion of Ford’s implementation of the 10 principles of the UNGC and support for broad UN development goals (please also see the [Sustainable Development Goals Index](#)).

Consistent with GRI guidance on boundary setting, the data in this report covers all of Ford Motor Company’s wholly and majority-owned operations globally, unless otherwise noted. Boundaries for each material issue are noted in our [GRI Index](#). Data measurement techniques, the bases of calculations, changes in the basis for reporting or reclassifications of data previously reported are included where relevant as footnotes to tables and charts.

Data Assurance

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

- Financial data was audited for disclosure in the Ford Annual Report on [Form 10-K](#)
- Verification data is not yet available for Ford’s 2014, 2015 and 2016 global facility greenhouse gas (GHG) emissions. One hundred percent of Ford’s 2014, 2015 and 2016 global facility GHG emissions will be third-party verified to limited assurance. Over 75 percent of Ford’s 2014, 2015 and 2016 global facility GHG emissions will be third-party verified to a reasonable level of assurance. In addition, all of our European facilities impacted by the mandatory E.U. 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 and Intechnica for Germany. 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 reports facility CO₂ emissions to national emissions registries or other authorities in the U.S., Canada, Mexico, Argentina, Brazil, China and Taiwan and the E.U. (Germany, Spain and U.K.)
- 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.

CUSTOMERS AND PRODUCTS

IN THIS SECTION

- [Reducing Vehicle Emissions](#)
- [Using Sustainable Materials](#)
- [Product Quality and Customer Satisfaction](#)

Our core business is to produce high-quality, smart, safe vehicles that delight our customers.

We use life cycle assessments to understand and reduce the overall impacts of our products and the materials we use; we are developing sustainable technologies to improve fuel economy; and we're exploring alternative fuel and powertrain options across our portfolio.

As part of our plan, we have invested heavily in electric vehicles, providing customers with efficient, low-carbon alternatives. We are also leaders in the use of sustainable, bio-based and recycled materials, helping us to enhance fuel economy, performance and end-of-life options.

The quality and safety of our products remain priorities of the utmost importance. We are committed to designing and manufacturing vehicles and technologies that achieve high levels of safety across a wide range of real-world conditions. We continue to get high marks in key public and private crash-testing programs, as well as in customer satisfaction and quality surveys, while our global Ford Driving Skills for Life education program is seen as an equally important contribution to road safety.

“Our customers are why we exist; their satisfaction is essential to our future success. Therefore, the quality of our products and services must be our number one priority, today and tomorrow.”

Bill Ford
Executive Chairman, Ford Motor Company

How We've Gone Further

 **Delivering Our Electrification Plans**
13 new electric vehicles to be launched by 2020 *Globally, more than 40% of our nameplates will be electrified*

 **Recycling Reaches New Heights**
We recycle 5 million pounds of aluminum scrap a week through our closed-loop recycling system *Enough to build 51 jumbo jets every month*

 **Growth in Sustainable Materials**
Annual CO₂ emissions cut by more than 20 million pounds by using soy foam in our new U.S. vehicles *In seat cushions, backs and headrests*

 **Keeping Customers Satisfied**
Customer satisfaction in North America was a best-ever 81% *Global Quality Research System (GQRS), 2016*

 **5-Star Safety Ratings**
Ford has seven Advanced Awards for innovative technologies, and six Best in Class Awards, from Euro NCAP *More than any other OEM*

 **Safer Behavior Behind the Wheel**
Ford Driving Skills for Life has now reached 1 million newly licensed drivers *Program active in 35 countries*

Reducing Vehicle Emissions

We are committed to making vehicles and technologies accessible to millions of people to help improve lives. But we also acknowledge that climate change is real and that we share a responsibility to address this global challenge.

In our products, as well as in [our operations](#), we are working to reduce greenhouse gas (GHG) emissions – including investing in powertrain technology and electrification, aerodynamics and weight reduction – to provide our customers with more efficient, lower-impact alternatives.

Cutting Emissions Across Our Portfolio

Responding to the risks and opportunities presented by climate change, our [science-based global strategy](#) aims to reduce GHG emissions from our vehicles. It encompasses our Sustainable Technologies and Alternative Fuels Plan to deliver high-quality products that meet consumer demand while also helping to limit future climate change. Our climate change stabilization commitment also aims to reduce GHGs from [operational processes](#).

Through this plan, and working closely with policy makers around the world, we continue to reduce GHG emissions from our vehicles in line with regional “glide paths.” These trajectories define the industry-wide emissions reductions needed to support stabilizing climate change.

We recognize that there's no single way to improve fuel efficiency and cut vehicle CO₂ emissions. That's why we take a portfolio approach across three areas:

-  **Vehicle**
- Offering customers the “power of choice” through affordable, accessible lower-carbon options:
- New engine/transmission technologies
 - Electrical system improvements
 - Aerodynamic improvements
 - Weight reductions
 - Advanced powertrain options
 - Electric vehicles
 - Vehicles powered by alternative fuels

-  **Fuel**
- Evaluating, developing and introducing vehicles that use fuels with lower fossil-carbon content:
- Biofuels
 - Electricity
 - Compressed natural gas (CNG)
 - Liquefied petroleum gas (LPG)
 - Hydrogen



Customer

Customers decide which vehicles and fuels to purchase and how those vehicles will be driven and maintained.

We promote “eco-driving,” providing training, information and vehicle technology to help customers use the least fuel possible.

Our Plan for a More Sustainable Future

For the past nine years, Ford has been following an ambitious plan of vehicle technology and alternative powertrain and fuel actions. By implementing this consistently, we are improving fuel economy and reducing CO₂ emissions across our product portfolio.

No one predicted the direction fuel prices would take over recent years. As fuel prices declined, so too has the demand for fuel efficiency, and customers are prioritizing other vehicle attributes such as performance and infotainment. When fuel prices are low, customers tend to be less interested in purchasing vehicles with advanced powertrain technologies that are more fuel-efficient but also more expensive.

Global Technology Migration Path – CO₂ Reduction

In Place (2017)

 **Internal Combustion Engine (ICE)**

- EcoBoost® engines widely available
- Diesel/after-treatment technology to reduce emissions

 **Alternative Fuels**

- Vehicle and powertrain capability to leverage renewable fuels
- Flex Fuel Vehicles
- CNG prepared engines available where demand exists

 **Energy Management, Electrical Architecture and Efficiency**

- Electric power steering widely available
- Global migration of battery management systems ongoing
- Aerodynamic improvements

 **Transmission and Driveline**

- 6-speed replaces 4- and 5-speed automatic transmissions

 **Weight Reduction**

- Significant weight reduction programs using conventional materials

 **Electrification**

- Start-Stop systems introduced
- Hybrids/Plug-In Hybrids available in >10% of nameplates
- 20 mile PHEV
- 76 mile BEV

 **Fuel Cells**

- First generation automotive fuel cell system complete

Near Term (2020)

Existing Technologies at High Volume

 **Policy/Mobility**

- Initiate cross-sector GHG mitigation discussions
- Engage in dialogue with technical and regulatory community on the “end-game” for future local air quality vehicle tailpipe emission standards

 **Internal Combustion Engine (ICE)**

- Advanced technologies to improve gasoline engine/EcoBoost® powertrain efficiency and performance
- Innovation in diesel technology
- Innovation to meet future local air quality vehicle tailpipe emission standards

 **Alternative Fuels**

- Expand product capability for renewable fuels

 **Energy Management, Electrical Architecture and Efficiency**

- Additional aerodynamic improvements

 **Transmission and Driveline**

- 8+ speed automatic transmissions and advanced driveline technologies widely available

 **Weight Reduction**

- Significant weight reduction programs using conventional and advanced materials

 **Electrification**

- Electrification solutions applied to manual transmissions
- Start-Stop widely available
- Hybrids/Plug-In Hybrids available in >25% of nameplates
- 30+ mile PHEV
- 200+ mile BEV

 **Fuel Cells**

- Develop second generation fuel cell technologies

Mid Term (2025)

Reduce Weight and Expand Electrification

 **Policy/Mobility**

- Introduction of autonomous vehicle (AV) technologies
- Introduction of commercial vehicle (CV) advanced technologies
- Introduction of smart mobility technologies

 **Internal Combustion Engine (ICE)**

- Expand and optimize gasoline engine/EcoBoost® technologies in conjunction with electrified and alternative fuel applications and improved fuel properties
- Further develop diesel technology to enhance capability and affordability in key vehicle segments

 **Alternative Fuels**

- Develop diesel/gasoline technologies compatible with low-carbon/renewable fuels

 **Energy Management, Electrical Architecture and Efficiency**

- Develop intelligent energy management technologies, e.g., waste heat recovery

 **Transmission and Driveline**

- Further develop electrified transmission and driveline technologies

 **Weight Reduction**

- Continued weight reduction using advanced materials

⚡ Electrification

- More efficient hybrid-specific engines
- Expand electrified driveline and transmission technologies
- Hybrids/Plug-In Hybrids available in >50% of nameplates
- Expand BEV volume

🔋 Fuel Cells

- Develop affordable fuel cell powertrain solutions for high-volume applications

Long Term (2030+)

Electrification/Alternative Fuels at High Volume

📶 Policy/Mobility

- Improve sustainability by integrating vehicle technologies, low-carbon/renewable fuels and Smart Mobility solutions
- Engage in cross-sector GHG mitigation projects

🚗 Internal Combustion Engine (ICE)

- Continue optimizing engine technologies for electrified applications
- Identify and incorporate advanced technologies that are compatible and synergistic with low-carbon/renewable fuels

💧 Alternative Fuels

- Evolve technologies in response to progress in low-carbon/renewable fuels

⚙️ Transmission and Driveline

- Expand functionality of transmission and driveline technologies in support of next-generation electric vehicles

📦 Weight Reduction

- Lightweight material models applied to global platforms

⚡ Electrification

- Next-generation Hybrid, Plug-in Hybrid and BEV technologies (lighter, smaller, reduced cost, improved functionality)
- Continued expansion of all-electric vehicles across portfolio

🔋 Fuel Cells

- Align fuel cell migration with fuels/infrastructure availability
- > [See our detailed vehicle fuel economy and carbon emissions performance](#)

Taking a Life Cycle Approach

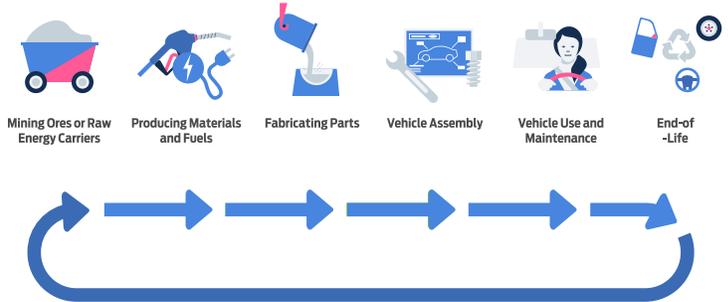
A life cycle assessment (LCA) is an analytical tool that helps identify and measure the potential environmental impacts of products or services. We use LCAs to understand and reduce the materials and energy used, and emissions generated, over the entire life cycle of our products.

Quantifying Vehicle and Fuel Impacts

As our product portfolio includes an ever-widening range of engines and fuels, LCAs become increasingly complex and all the more important. We are continuing to develop a portfolio of LCA tools to gain a more holistic understanding of the impacts of our products over their life cycle. In 2016, Ford researchers published a [physics-based LCA model](#) to quantify the energy and GHG emission benefits of lightweighting electric vehicles.¹

The life cycle of a vehicle spans the environmental impacts associated with everything from the mining of the ores and metals used in its manufacture, through the production of materials, fuels and components, and the assembly, use and maintenance of the vehicle to, finally, its disposal.

Our Product Life Cycle



Historically, much of our work to improve the life cycle performance of our products has focused on their tailpipe or tank-to-wheels (TTW) greenhouse gas (GHG) and other emissions. However, we are now also working to understand the well-to-wheels (WTW) impacts of our products and the fuels they use. Estimates of WTW emissions vary with the specifics of the vehicle, engine and fuel type:

At what life cycle stage are most GHG emissions released?

- In gasoline- and diesel-powered vehicles (including hybrids)... **it is during the vehicle's use**
- In plug-in hybrids,² battery- and hydrogen-powered vehicles... **it is during production of the fuel (electricity or hydrogen)**

When comparing gasoline- and diesel-powered vehicles, diesels generally have lower lifetime GHG emissions than gasoline equivalents. And in vehicles with other powertrains, overall CO₂ emissions depend on the carbon intensity of the electricity or hydrogen production. The emission benefits of battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs) are maximized when the electricity is generated from low-CO₂ sources such as wind or solar power.

> [Read more about our work to develop alternative fuel and powertrain options](#)

Regardless of the fuel used, GHG impacts from fuel production are part of the total vehicle life cycle impacts. They are not within the control of the vehicle manufacturer, and need to be addressed under a separate framework. To achieve the desired GHG reductions in this stage, other stakeholders such as fuel producers, infrastructure developers and government are essential participants in the development of a solution.

How We Apply LCA

We are applying our LCA knowledge in research and development using, for example, our Product Sustainability Index (PSI) in Europe. This tool assesses a range of attributes, from life cycle global-warming potential and air-quality potential to the use of sustainable materials, external noise, safety, capacity relative to vehicle size and ownership costs over the first three years. Through the PSI, several European vehicles have demonstrated improved environmental, social and/or economic performance over their life cycle when compared with previous models.

We use LCA to help us assess the environmental and cost impacts of different materials. We are currently studying the energy and GHG emissions from producing carbon fiber automotive parts and comparing these impacts to the fuel savings these parts can help generate.

Driving the Science of Sustainability

Ford researchers have played a leading role in an industry-government cradle-to-grave LCA, which explored the costs and GHG emissions of current and future technology for light-duty vehicles. Compared to a conventional gasoline vehicle, CO₂ abatement costs were estimated to be around \$100s per metric ton, increasing to \$1,000s per metric ton for alternative vehicle-fuel pathways. The [data, assumptions and methodology have been made available publicly](#) to inform technical discussions about cost-effective strategies to reduce CO₂ emissions.

We believe that addressing climate change requires a multi-sector approach, in which the cost-effectiveness of CO₂ abatement options will be of critical importance. We are conducting research to compare the cost-effectiveness of actions intended to achieve emission reduction targets in sectors facing high abatement costs (such as transport) with those in other sectors.

> [Read about how we're addressing non-CO₂ emissions](#)

1. H.C. Kim, T.J. Wallington, "Life cycle assessment of vehicle lightweighting: A physics-based model to estimate use-phase fuel consumption of electrified vehicles," *Environ. Sci. Technol.*, 50, 11226 (2016).
2. Plug-in hybrids that travel long distances or use renewable electricity can incur more GHG emissions from vehicle use than fuel production.

Improving Fuel Economy

Through our Sustainable Technologies and Alternative Fuels Plan, we use a variety of approaches to improve the fuel economy of our conventional gasoline- and diesel-powered vehicles.

Engine and Transmission Technologies

Gasoline Engines

Our EcoBoost® engines use turbocharging and direct fuel injection to deliver significant fuel-efficiency gains and reduced CO₂ emissions in gasoline-powered vehicles. So far, we've brought this fuel-saving technology to more than 8 million engines worldwide, ranging in size from 1.0L to 3.5L, and there are more than 1 million Ford EcoBoost®-equipped trucks on the road today.

Ford's 1.0L EcoBoost® engine has been voted best in class at the International Engine of the Year Awards for the fifth year in a row. Judges praised the combination of drivability, performance, economy, refinement and technology that continues to set the standard.

Thanks to its all-new 3.5-liter EcoBoost® engine, paired exclusively with our new 10-speed automatic transmission, the 2017 Ford F-150 lineup has shown improvements in its EPA-estimated fuel economy ratings. The 2017 Ford F-150 truck was named the American Council for an Energy-Efficient Economy (ACEEE) Greener Choice award winner, the only full-size truck in the list.

Thanks to EcoBoost®, F-150 owners alone will save more than 110 million gallons of gas during 2017; that's the equivalent of 13 oil supertankers.

Ford continues to innovate, building on the strong EcoBoost® engine foundation, while understanding that specific applications and markets may dictate different solutions. New technologies are being investigated and developed to improve performance, fuel economy and emissions for multiple powertrain options, including hybridization. Major areas of focus include advanced boosting, reduced friction, and advanced fuel injection and ignition.

Moving forward, we will continue to assess the importance of low-carbon renewable fuels on CO₂ reduction and their impact on future powertrain designs.

Advanced Transmissions and Drivelines

The all-new 10-speed automatic transmission available for 2017 F-150 4x2 and 4x4 models – our first volume-production 10-speed automatic – improves powertrain efficiency by maximizing engine operation within its optimal range. Along with the new EcoBoost® engine, this new powertrain combination provides better low-end and peak performance, which is ideal for hauling heavy payloads and towing trailers.

We continue to progress both front- and rear-wheel-drive transmissions to optimize the overall powertrain, including the development of advanced torque converters to enable aggressive lock-up operation and improved hydraulics to reduce oil pumping losses, all aiming to increase efficiency and performance while enabling quick, smooth shifts.

Additionally, we are developing driveline technologies to reduce parasitic losses while enhancing function and drivability, including low-drag all-wheel-drive systems.

Diesel Engines

Diesel engines operate lean and unthrottled, and at a higher compression ratio than gasoline engines, and diesel fuel has approximately 10 percent more energy by volume than gasoline.

As a result of these factors, modern diesel engines consume 25–30 percent less fuel by volume (15–20 percent less by energy) than gasoline engines and, on a well-to-wheels (WTW) basis, emit up to 20 percent less CO₂ per kilometer. Thanks to technologies such as diesel oxidation catalysts, diesel particulate filters, selective catalytic reduction systems and lean nitrous oxide (NO_x) traps, non-CO₂ emissions such as NO_x and particulate matter have been greatly reduced relative to past models. Our research and development activities continuously pursue innovative solutions for even cleaner and more efficient propulsion systems.

In Europe, we have enhanced our lineup of 1.5L and 2.0L TDCi engines with the all-new 2.0L EcoBlue engine: a new generation of clean, efficient, refined and high-performance diesel engines that are already available in Ford's light-duty commercial vehicles. In North America, we offer two advanced diesel engines: the 6.7L Power Stroke V8 available in our SuperDuty and Medium Duty commercial trucks, and a new 3.2L Power Stroke turbo diesel in the Transit Van. Diesel engines continue to be a popular option, due to their excellent drivability, CO₂ emissions and fuel consumption characteristics when carrying heavy loads.

As our plans develop further, we are maintaining a special focus on sustainable fuels, and already today, our advanced diesel engines are compatible with biodiesel.

> [See our detailed vehicle fuel economy and carbon emissions performance](#)

Reducing Vehicle Weight

We are adopting advanced lightweight materials to help reduce fuel consumption wherever practicable. For example, our F-Series trucks feature advanced aluminum alloy bodies, allowing us to save weight and deliver even more capability. Later in 2017, we also plan to release an Expedition featuring an aluminum body.

Together with Magna International, we have developed a prototype carbon fiber composite subframe that reduces mass by 34 percent compared to the stamped steel equivalent. This lightweight subframe will help reduce CO₂ emissions and improve fuel efficiency, helping automakers meet [federal clean car standards](#). The subframe also replaces 45 steel parts with two molded and four metallic parts: an 87 percent reduction.

We have also developed an incredibly light but strong cargo floorboard in the all-new Ford EcoSport, made of high-strength 100 percent recycled paper and water-based glue. The honeycomb design, inspired by beehives, is able to handle more than 100 times its six-pound weight in cargo.

> [Find out more about our use of sustainable materials](#)

What's Next in Fuel Economy?

To help us meet consumers' growing appetite for vehicles with greater fuel efficiency, we have invested \$200 million in a new aerodynamic testing complex. The new facility, to be located next to our Driveability Test Facility in Allen Park, Michigan, will feature innovative technology that simulates real-world driving conditions, including a next-generation rolling road wind tunnel and state-of-the-art climatic chamber, to advance improvements in fuel economy.

We're also exploring how 3D printing could help produce lighter-weight parts that lead to better overall vehicle fuel efficiency. Ford is the first automaker to pilot the Stratasys Infinite Build 3D system, capable of printing large-scale, single-piece automotive parts like spoilers. Housed at the Ford Research and Innovation Center in Dearborn, it could provide a more efficient, affordable way to create low-volume prototype parts, personalized items or specialized race car components.

> [Watch a short video of the printer in action.](#)

Alternative Fuels and Powertrains

Our Sustainable Technologies and Alternative Fuels Plan includes the research and development of alternative powertrains and fuel options across all our vehicles, helping us go further through new capabilities.

Our Pathway to Lower-Carbon Options

Delivering on our promise to give customers the power of choice, we offer a range of powertrain and fueling options designed to reduce vehicle CO₂ emissions, as well as improve fuel efficiency.

As part of our strategy to support global [climate stabilization goals](#) and a more sustainable product portfolio, we have developed a roadmap for migrating our vehicle technologies toward the use of lower-carbon fuel options (see graphic below).

Our Global Fuels Migration Path

In Place (2017)

Gasoline and Diesel

- Growth of fossil fuel continues with developments in extraction technologies

Electricity (HEV, PHEV, BEV)

- Electricity grids start to transition to low-fossil CO₂ future

Renewable Biofuels

- First generation biofuel production increases

CNG and LPG

- CNG and LPG available in limited markets

Near Term (2020)

Electricity (HEV, PHEV, BEV)

- Electricity grids continue to transition to low-CO₂ future
- Fleet programs confirm grid/infrastructure readiness for plug-in HEVs and BEVs

Renewable Biofuels

- Second generation biomass-based fuels introduced at low volume
- Renewable fuel capacity expands in select markets

CNG and LPG

- CNG expands in commercial fleets and available in limited markets

Hydrogen Fuel Cell

- Limited hydrogen fueling site Limited hydrogen fueling sites

Mid Term (2025)

Gasoline and Diesel

- Gasoline/diesel fuel quality improvements

Electricity (HEV, PHEV, BEV)

- Electricity grids continue to transition to low-CO₂ future
- Grid/infrastructure and standardization support expansion of plug-in HEVs and BEVs

Renewable Biofuels

- Second generation biomass-based fuel production expands

CNG and LPG

- CNG availability increases with demand and production capacity

Hydrogen Fuel Cell

- Limited hydrogen fueling sites

Long Term (2030+)

Gasoline and Diesel

- Further gasoline/diesel fuel quality improvements to support advanced vehicle technologies

Electricity (HEV, PHEV, BEV)

- Clean electricity further enhances the benefit of plug-in HEVs and BEVs

Renewable Biofuels

- Renewable fuel capacity expands in all markets

CNG and LPG

- CNG from alternative/renewable sources
- Increasing fraction of liquid renewable hydrocarbons in fuel portfolio

Hydrogen Fuel Cell

- Potential to begin ramp-up of hydrogen/infrastructure

ELECTRIC VEHICLES

Extending Our Electrification Plans

Leading in electrification, as well as [autonomy and connectivity](#), is critical to our expansion to both an automotive and a mobility company. Our extended electric vehicle strategy aligns with increasing calls for cleaner, more efficient vehicles, and we remain focused on delivering affordable electric vehicles at scale.

We already have nearly two decades of experience in electrification – vehicles that run on a battery-powered electric motor or a combination of electric and gasoline powertrains – and infrastructure to support this. And at the end of 2016, we were the top seller of plug-in hybrid vehicles and second largest seller of electric vehicles¹ in the United States, having sold 560,000 electric vehicles globally.

Our \$4.5 billion investment in electrification will support the introduction of 13 new electric vehicles; these include hybrid versions of the F-150 and Mustang, a Transit Custom [plug-in hybrid](#), two hybrid police vehicles and a fully electric small SUV by 2020, along with an autonomous hybrid vehicle designed for commercial ride-hailing or sharing by 2021. Globally, more than 40 percent of our nameplates will offer electric versions by 2020.

In expanding our electric vehicle efforts, we are also:

- Testing hybrid taxi and van prototypes in a number of U.S. cities
- Investing \$700 million in the production of electric and autonomous vehicles, and creating 700 jobs, in our Flat Rock assembly plant in Michigan
- Expanding our battery development program into Europe and Asia
- Using insights from 33,000 Ford electric vehicle owners to better understand how they use their vehicles

As well as focusing our efforts on areas of strength, such as commercial vehicles, trucks, utility and performance vehicles, we are looking at electric vehicle fleet management, route planning and telematics solutions, and piloting wireless recharging technology.



Hybrid Electric Vehicles (HEVs)

HEVs are powered by both an internal combustion engine (ICE) and an electric motor with a battery system. When using the electric motor and battery system only – at low speeds and for short distances, for example – they don’t consume gasoline. All our hybrid vehicles can run on battery power, on ICE power or a combination of both to optimize fuel efficiency. They have a regenerative braking system that captures energy, otherwise lost to braking, to recharge the battery. We are currently increasing our hybrid capability across our highest-volume global product platforms, including the Ford C-MAX, Ford Fusion, Ford Mondeo and Lincoln MKZ.



Plug-in Hybrid Electric Vehicles (PHEVs)

PHEVs are powered by an ICE and a high-voltage electric battery that, unlike HEVs, can be charged from a household or public electric outlet. When the battery is depleted, the vehicle functions as a standard HEV. PHEVs also accrue charge through regenerative braking and discharge it during use. This provides additional fuel savings and can reduce direct tailpipe emissions to zero when running on battery power. Our two PHEVs are the Fusion Energi and the Ford C-MAX Energi.



Battery Electric Vehicles (BEVs)

BEVs use a high-voltage electric motor, powered by a battery pack. Their primary benefit is their lack of tailpipe CO₂ and other emissions during use; however, they are not necessarily totally zero-emission over their entire life cycle, as this depends on the source of electricity used for charging. Our electric vehicles use lithium-ion batteries, offering better performance than the nickel-metal-hydride batteries they replaced. The new Focus Electric offers a projected 115-mile range on a single charge, and DC fast-charging capability able to deliver an 80 percent charge in around 30 minutes.

> [Read our front page story for more information about how we’re delivering our electrification plans](#)

VEHICLES POWERED BY ALTERNATIVE FUELS Renewable Biofuel Vehicles

Biofuels made from renewable resources offer a relatively affordable way to reduce CO₂ emissions. Two types are widely used:

- **Ethanol**, primarily made from fermented corn sugars or sugar cane, is usually blended with gasoline. In the U.S., most retail market gasoline already contains up to 10 percent ethanol (E10), while E85 (U.S. and Europe) and E22/E100 (Brazil) are also common

- **Biodiesel**, made from soy, canola, rapeseed, corn or palm oil, or animal fats, is primarily mixed with fossil diesel. The most common blends are B5 and B20 (in the U.S.) and B7 (in Europe)

We also support the further development and expanded production of next-generation biofuels made from plant cellulose. These can cut GHG emissions significantly, and using stems and leaves from crops such as corn also reduces competition with food crops.

Compressed Natural Gas (CNG) and Liquefied Petroleum Gas (LPG) Vehicles

We offer engine packages specially prepared by qualified vehicle modifiers for conversion to compressed CNG and LPG on many vehicles. Typically, CNG and LPG vehicles have lower CO₂ and life cycle GHG emissions than gasoline or diesel vehicles; they also have lower [non-CO₂ emissions](#). Vehicles with gaseous-prepped engines can be converted to CNG, LPG or to a bi-fuel system capable of running on either fuel or on conventional gasoline. We offer a wide range of commercial vehicles with CNG and LPG.

Hydrogen Fuel Cell Vehicles (FCVs)

FCVs are zero-emission electric-drive vehicles. The fuel cell system converts stored hydrogen to electricity, leaving only water and low-temperature heat as by-products. Through the Automotive Fuel Cell Cooperation (AFCC) in Vancouver, a joint venture with Daimler AG, we conduct research to overcome key barriers to commercialization including cost, durability and fuel infrastructure.

CO₂ Savings vs. Gasoline (E10) in the U.S.

Powertrain/Fuel	“Tank-to-wheels” ⁶ CO ₂ emissions	“Well-to-wheels” ⁷ CO ₂ emissions
HEV	28%	28%
PHEV ^{2,8}	45%	36%
BEV ²	100%	51%
E85 ³	2%	27%
CNG	25%	19%
LPG	11%	13%
FCV ⁴	100%	41%
Diesel	15%	14%
B7 ⁵	15%	17%
B20 ⁵	15%	24%

What’s Next in Alternative Fuels and Powertrains?

One of the electronic vehicles we’re adding to our portfolio, the PHEV Ford Transit Custom van, is the centerpiece of a multimillion-pound project designed to help improve air quality in London. The 12-month trial, featuring 20 vans running mainly on electric power for the majority of urban trips, will explore how PHEVs can contribute to cleaner air targets and address local transportation challenges.

To help facilitate the adoption of mass-market BEVs, we’ve also signed a Memorandum of Understanding with BMW Group, Daimler AG, Volkswagen Group, Audi and Porsche to create the highest-powered charging network in Europe. Starting in 2017, we aim to build a sizable number of ultra-fast charging stations to enable long-range travel for BEV drivers.

> [Learn about our electrification strategy in China](#)

1. HEVs, PHEVs and BEVs.
2. Average grid electricity mix.
3. Ethanol from corn.
4. Hydrogen from steam methane reforming of NG at central plant.
5. Biodiesel from rapeseed (RME).
6. 2015 US Vehicle efficiency from Elgowainy, A. et al. (2016) Argonne National Lab report number ANL/ESD-16/7.
7. Well-to-tank from GREET 2015.
8. PHEV has c.20 km all-electric range.

Addressing Non-CO₂ Emissions

We take the impacts on air quality and the related health risks from vehicle tailpipe emissions very seriously, and are working hard to address emissions beyond CO₂ in our research, product development and operations.

Smog-forming vehicle tailpipe 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_x), carbon monoxide and particulate matter. We recognize that these pollutants increase with vehicle congestion.

Meeting Regional Tailpipe Emissions Standards

United States

Currently, the U.S. Environmental Protection Agency (EPA) requires vehicles to be certified to its Tier 2 regulations, which have helped reduce smog-forming emissions since 2004. The EPA's more stringent Tier 3 standards are being phased in from the 2017 model year. California has its own Low Emission Vehicle II (LEV II) program for light-duty vehicles, with different requirements from the federal Tier 2 program; LEV III requirements, which began to be implemented with the 2015 model year, closely align with the EPA's Tier 3 program. We plan to comply with both Tier 3 and LEV III standards as they are phased in.

Europe

All new passenger cars registered since September 1, 2015 comply with the Euro 6 tailpipe emissions standard Phase I. The more stringent Euro 6d Real Driving Emissions (RDE) standard will apply from September 2017. For our light-duty segment, the Transit Connect and Transit Courier already comply with Euro 6 Phase II.

In recent years, concerns in Europe that real-world emissions are higher than tested emissions led to the development of the RDE protocol, which will involve testing vehicles on the road using portable emissions analyzers. In 2015, these concerns were reinforced by reports that a competitor OEM deliberately utilized different calibrations for test conditions and for on-road use, defeating the purpose of the emission tests.

Ford supports efforts to ensure that test procedures more closely match the real-world conditions that customers experience under normal driving. Ford has supported the inclusion of the RDE initiative in the Euro 6 standards, and we have also been involved in the development of the Worldwide Harmonized Light Vehicles Test Procedure (WLTP). These efforts will help to ensure that improvements in vehicle emission control systems will translate to improvements in urban air quality.

Ford will measure and publish RDE results, including NO_x emissions, according to Euro 6.2 emission regulation from 2016 onward. Ford complies with regulatory requirements worldwide, and we have processes and controls in place to ensure that compliance is ongoing.

China

The China Ministry of Environmental Protection released the national stage-6 emission standard for light-duty vehicles in December 2016. The standard is based on the Euro 6 framework, adopting the WLTP for tailpipe emission tests, US EPA Tier 2 fuel evaporation and onboard refueling vapor recovery (EVAP/ORVR) requirements, and California onboard diagnostics requirements (OBD II). Tailpipe emission limits are set as follows:

- 6a, which equates to Euro 6 limits, will come into effect in July 2020
- 6b, which is approximately 40–50 percent lower than 6a (depending on pollutants), will come into effect from July 2023

Other Regions

In other regions, Ford meets the required tailpipe emissions regulations. These are generally based on the European non-CO₂ tailpipe emissions regulations system, but vary by country. For example:

- In India, we meet the current regulations, based on Euro 4 and Euro 5 standards, and will meet Bharat Stage VI (BS VI) standards from April 2020 based on Euro 6
- In Brazil and Argentina, we meet new regulations based on Euro 5
- In the Middle East, where emission limits are largely constrained by fuel quality, we meet the current standards based on Euro 2, and 2018MY vehicles will meet standards based on Euro 4 gasoline (Euro 3 diesel)

> [See our tailpipe emissions data in detail](#)

Beyond the Tailpipe

With the decreasing trend in vehicle tailpipe emissions, other emissions assume a larger proportional importance.

Through our Restricted Substance Management Standard, we have:

- Prohibited GHGs such as perfluorocarbons (PFCs) and sulfur hexafluoride (SF₆)
- Replaced all chlorofluorocarbons (CFC) refrigerants with hydrofluorocarbons (HFCs), which do not contribute to ozone depletion and have significantly lower global warming impacts

Globally, we continue to lower non-CO₂ GHG emissions. We have replaced HFC-134a with HFC-1234yf, a compound with a lower global warming potential, in passenger cars registered starting in 2017 in Europe; in the 2017MY Escape, Fusion, MKZ, F-150 (except Phantom), GT and Focus in the United States and Canada; and in the 2017MY Focus, Kuga, Mondeo and MKZ in South Korea.

The lack of servicing infrastructure and substantially higher costs limit the use of HFC-1234yf in other markets, but we remain committed to further reducing non-CO₂ emissions wherever practical and cost-effective.

We are exploring current and likely future particulate matter emissions associated with brake and tire wear and from different vehicle powertrain technologies, comparing these with current and future tailpipe emissions. We will discuss our findings in a future report.

Using Sustainable Materials

Through our global materials strategy, we are increasingly using materials that are more sustainable from a total life cycle perspective, including recycled, renewable and recyclable materials, and working to decrease or eliminate less sustainable materials.

Our Sustainable Materials Strategy

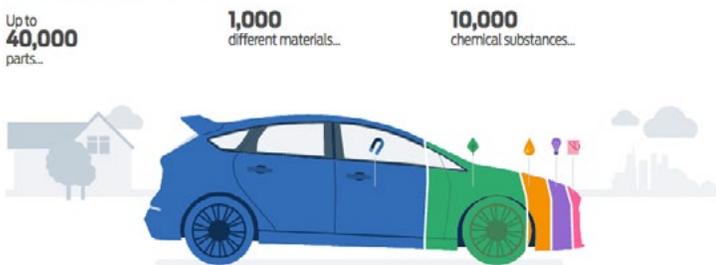
Ford continues to be a leader in the research, development and integration of more sustainable, bio-based and recycled content in our vehicles. We aspire to choose materials that have been obtained by socially sustainable means, that have lower environmental impacts and that provide equivalent or superior performance to existing materials. Aspects to consider include a material's origin (virgin, renewable or recycled), the methods used to source and process it, the emissions generated throughout its life cycle and its application.

The choice of materials is an important factor in a vehicle's sustainability, across all life cycle stages and throughout our value chain. It can influence vehicle safety, fuel economy and performance, as well as the options for recycling or reusing components at the end of a vehicle's life. We continue to reduce the number of materials we use, and prioritize locally sourced materials where we can to reduce their carbon footprint.

Our holistic view of the materials used in our vehicles involves:

- Increasing use of recycled materials
- Continuing to develop and implement plant-based renewable materials
- Eliminating substances of concern
- Addressing any health impacts of some materials
- Addressing end-of-life impacts (i.e., landfilling) through improved recyclability
- Working with environmentally and socially responsible suppliers
- Continuing research on closed-loop recycling and second life use of components
- Partnering with other industries and the farming community to utilize their by-products

What's in a Typical Vehicle?



75% Metals (steel, aluminum, magnesium and titanium)



17% Plastics, Elastomers, Textiles and Natural Materials



4% Fuels and Consumable Liquids (engine oil, lubricants)



3% Electronics, Ceramics, Glass and Other Compounds



1% Miscellaneous (paint, adhesives, sealants, etc.)



Recycled Materials

Using recycled content in materials diverts consumer and industrial waste from landfill, reduces the depletion of natural resources, and can lower both energy consumption and costs. However, these materials must deliver the same quality, appearance and performance as virgin materials. We are now concentrating our efforts on nonmetallic materials, which are often composed of virgin content.

Closed-Loop Recycling

In some cases, we recycle the materials from our auto parts back into the same use, a process known as “closed-loop recycling.” For example, aluminum can be reused many times without loss of quality, and recycling aluminum requires 95 percent less energy than refining raw aluminum from bauxite, as well as avoiding the environmental impacts of mining.

Ford recycles 5 million pounds of high-strength, military-grade aluminum scrap a week through the closed-loop recycling system now in use at three Ford factories. That's enough to build more than 37,000 new F-Series truck bodies a month.

We work closely with our suppliers to recycle aluminum scraps, or “chips,” from the production of the 2017 Ford F-150 to make more vehicles. These chips, most of which come from stamping windows into body panels, can comprise 40 percent of the original metal used. To achieve the level of purity required for auto bodies, we have invested \$60 million in equipment that separates, cleans and shreds aluminum, and transfers it straight into designated trucks.

[Watch how we recycle tons of aluminum, one chip at a time.](#)

Nonvisible Applications

Where viable, we also “upcycle” materials into uses with higher material and performance requirements. In line with our global sustainable materials strategy, certain nonvisible plastic parts must be made out of plastics from post-consumer recycled waste, such as nylon, tires and battery casings. For example:

- We are working on transforming post-consumer laundry detergent containers and milk bottles into blow-molded automotive components
- We are also investigating how post-consumer drinks bottles may be used to make energy-absorbing materials

Visible Applications

Using recycled materials for interior parts such as seat fabrics, components and carpets requires us to achieve the necessary appearance as well as performance. To date, we have developed 50 seat fabrics made from at least 25 percent post-industrial or post-consumer recycled content, and currently use recycled seat fabrics in 12 vehicles.

Renewable Materials

We continue to use more plant-based materials to reduce our carbon footprint and our dependence on petroleum.

The environmental, economic and performance benefits of durable, plant-based materials include reductions in greenhouse gas (GHG) emissions, vehicle weight and fuel consumption; lower manufacturing energy use and costs; reduced use of petroleum and non-sustainable resources; diverting waste from landfill; and the creation of new markets and revenue opportunities for farmers.

“Someday, you and I will see the day when auto bodies will be grown down on the farm.”

Henry Ford, 1934

Why Renewable Materials Matter to Ford

Around 8 percent of all the petroleum oil used in the world each year goes to making plastic. Once used, up to half of all plastic is dumped into landfills. Much of the rest is burned, and millions of tons are dumped into our oceans; relatively little is recycled. In response to the ocean waste problem, our research team has recently initiated an effort to investigate automotive uses for ocean plastic.

The average Ford vehicle uses around 20–40 pounds of renewable materials.

Driven by concerns around cost, supply and environmental protection, Ford scientists are researching ways to replace petroleum oil as the main ingredient in plastic. We began researching the use of sustainable materials to rival and replace petroleum-based plastics in our vehicles in 2000. Having introduced the industry’s first soy-based foam in seat cushions and seat backs in 2006, our renewable materials program has now expanded to include a number of different renewable material applications, all of which meet strict performance and durability specifications.

We have implemented many world- and industry-first renewable materials, including wheat-straw storage bins, rice hull wiring harnesses and tree-based cellulose. These materials are lighter in weight, meet all durability and performance requirements, and provide new revenue streams for North American farmers. We have achieved all this while lowering GHG emissions and reducing petroleum consumption.

> [Watch a video about Ford's renewable materials program.](#)

From Bluejeans to Rice Hulls



See the recycled and bio-based materials used on the new F-150.

- **Truck body:** All the weight-saving aluminum used is recyclable
- **Seat backs, cushions and head restraints:** Use soy-based polyurethane foam
- **Sound insulation:** Padding made from recycled cotton and bluejean production scrap
- **Wiring harness:** Made using rice hulls
- **Fuel lines:** Contain castor oil-based nylon
- **Underbody cover:** Contains recycled rubber from post-consumer tires and polypropylene
- **Exterior mirror gaskets:** Contain post-consumer recycled tires and soybean oil

Our Current Technology

- Coconut fibers are used in the trunk liners of the Ford Focus Electric.
- Seat cushions, storage bins and door panels are just a few of the many items we make with renewable materials.
- We're working on making sustainable car parts out of tomato peel and other by-products from the farm.

Scientists at our research centers in the U.S., Germany, China and Brazil are developing foams, plastics and composites derived from renewable resources for use in millions of vehicles every year.

In our North American vehicles, all seat cushions, backs and headrests contain soy foam. Castor oil is used in all vehicles for fuel lines and in several vehicles for instrument panel foam. We are also developing applications that use locally sourced and plentiful plant oils – 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 – in instrument panels, seals and gaskets.

Almost 300 vehicle parts are derived from renewable sources such as soybeans, cotton, wood, flax, jute and natural rubber.

We use renewable, plant-based natural fibers to reinforce plastic in our vehicles:

- Cellulose-reinforced plastic, using fibers from sustainably grown trees, has been used to replace fiberglass in center console armrests
- Wheat-straw-reinforced plastic is used in storage bins

- Kenaf, a tropical plant, is used in compression-molded plastic door parts
- Rice hulls are used to reinforce electrical brackets

Almost 300 vehicle parts are derived from renewable sources such as soybeans, cotton, wood, flax, jute and natural rubber.

We are also looking at ways to utilize other waste streams and by-products, such as recycled tires, recycled T-shirts and denim, recycled plastic bottles and even shredded U.S. currency. Ford researchers in Asia Pacific recently announced their work to reinforce plastics with bamboo fiber, which is strong, plentiful and aesthetically pleasing.

Meanwhile, Dearborn researchers are focused on agave fiber, grown for tequila production in Mexico ([see below](#)). This fiber is exceedingly tough and available in large quantities locally. Instead of burning the fiber, utilizing it as a plastics reinforcement will reduce CO₂ emissions, improve fuel economy and provide farmers with additional revenue.

CASE STUDY

Agave By-Products Get a Second Chance

In tequila production, once the heart of the agave plant is harvested and roasted, and its juices extracted for distillation, a portion of the remaining fibers can be used as compost for local farms, or used by local artisans to make crafts. However, there is a huge surplus of fiber, and much of it is burned in the field, producing greenhouse gas. Now, as part of a broader sustainability plan, Jose Cuervo® has joined forces with Ford to develop a new way to use its remnant fibers.

Together, we're exploring the use of its by-products to develop sustainable bioplastics for our vehicles, and testing them for use in components such as wiring harnesses, heating and air-conditioning units, and storage bins.

Initial assessments highlight the potential for success, given the composite's durability and aesthetic qualities. It could reduce vehicle weight and improve fuel economy, while reducing our reliance on petrochemical-based plastics.

“There are about 400 pounds of plastic on a typical car. Our job is to optimize the material properties of a natural fiber composite such as agave, and then find the appropriate place for it on our vehicles. This will help Ford to reduce our impact on the planet. It is work that we're really proud of, and it could certainly have broad impact across numerous industries.”

Debbie Mielewski

Senior Technical Leader, Sustainable Materials Research, Ford Motor Company

> [See the route agave takes to get a second life in a Ford vehicle.](#)

Our Research Partnerships

We continue to research renewable materials and potential applications at our research centers around the world, and through partnerships with suppliers and nonautomotive partners.

Along with Coca-Cola, Nike and Procter & Gamble, we co-founded the plant-based PET Technology Collaborative (PTC), a strategic working group focused on accelerating the development and use of 100 percent plant-based PET materials and fibers. Collaborations with these companies to further our sustainability efforts include:

- The first automotive use of Coca-Cola's PlantBottle plastic, used in the seat fabric, trim, carpets and headliner in a Focus battery electric demonstration vehicle
- Partnering with Procter & Gamble to use biomimicry, inspired by nature's solutions, to solve some of the most challenging material issues facing our industries

We are also part of WWF's [Bioplastic Feedstock Alliance \(BFA\)](#), working to support the responsible development of plastics made from plant material, and helping build a more sustainable future for the bioplastics industry.

And we were excited about recent laboratory success in generating polyurethane foams that meet general durability and performance requirements, which utilize CO₂ as a feedstock.

› [See how we're sequestering excess CO₂ to make durable plastics and foams for use in our vehicles](#)

Eliminating Substances of Concern

Through a range of processes and tools for monitoring and managing materials and substances, we ensure our products meet all relevant local and global regulations. We have also managed to eliminate or reduce substances of concern where economically and technically feasible, well ahead of regulatory requirements.

How We Monitor and Manage Materials

Our Restricted Substance Management Standard (RSMS) designates the substances to be restricted or eliminated from our operations and our vehicles. The first of its kind in the industry, the RSMS process is embedded in our Global Product Development System (GPDS).

We also monitor and manage materials through the following systems and tools:

- **International Material Data System (IMDS):** An industrial web-based tool sponsored by around 40 original equipment manufacturers (OEMs) and used by more than 100,000 automotive supplier companies to track, review and report vehicle components, materials and substances
- **Global Materials Management (GMM):** Ford's materials and substances tracking and reporting tool used by Ford engineers and suppliers
- **Global Material Approval Process (GMAP):** System for reviewing and approving materials used in Ford plants and facilities, for both production and non-production materials (e.g., vehicle and plant floor paints, steel, plastics and adhesives)
- **Materials and Toxicology System (MATS):** Ford's internal database for managing specifications, Material Safety Data Sheets and Approved Source List, and generating compliance reports

Continuing Our Progress

- We were one of the first automotive companies working to eliminate a number of chemicals¹ being monitored by governments around the world, including the E.U., U.S., Canada, Japan and China
- We phased out "hex chrome" (hexavalent chromium) across our operations and products before it was banned. Hex chrome is a corrosion coating used on nuts, bolts and brackets that the U.S. Occupational Safety and Health Administration lists as a potential lung carcinogen and is banned by End of Life Vehicle Directives issued by the E.U., Japan and South Korea
- Globally, we have transitioned from lead to steel wheel weights
- The Alliance of Automobile Manufacturers has a Memorandum of Understanding with the U.S. Environmental Protection Agency committing to phase copper out of brake friction material, because it degrades on use and can end up in the water cycle through urban drainage systems. We already offer vehicles with copper-free brake pads
- We eliminated mercury from all components, and we're working to address end-of-life impacts associated with [mercury-based components](#) in older vehicles

- We have a phase-out requirement for all E.U. REACH-restricted substances that have reached or are approaching their sunset dates²
- We monitor, and provide advice to relevant governmental agencies about, ongoing developments in other global substance restrictions such as the [Stockholm Convention](#)

Taking a leadership role in our efforts to eliminate less desirable chemicals, we lead or chair several industrial association working groups. These include:

- The U.S. Council for Automotive Research's North America Automotive Substances of Concern Committee
- The Automotive Industry Action Group's Chemical Management and Reporting Group
- The Global Automotive Declarable Substance List (GADSL) Steering Group
- ACEA's (E.U. car manufacturer association) working group on Materials and Substances

Rare Earth Elements

Small quantities of the 17 "rare earth elements" (REEs) are used in internal combustion engine vehicles, and the motors and battery systems of electric vehicles contain neodymium and dysprosium, yet REEs are hard to extract, both economically and sustainably. Having assessed the (albeit small) amount of REEs our vehicles contain, we have focused on reducing their use in our electrified vehicle battery systems. Compared to its predecessors, our third-generation hybrid battery system is expected to save up to 500,000 pounds of REEs annually.

› [Read more about our approach to managing human rights issues associated with conflict minerals](#)

Ensuring Occupant Health

Ford is working to provide healthy vehicle interiors and use information technology to improve occupant health and wellness.

Air Quality

Under specific conditions, the properties that make nanoscale materials useful may also pose risks to human health and the environment. Current research largely focuses on exposure during manufacturing and processing, but we want to prevent any unwanted consequences that might occur during the entire life cycle of nanoparticles, due to environmental factors (moisture, temperature, etc.) or mechanical actions (vibrations, abrasion, etc.). The Ford Plastic Research group has developed guidelines to ensure that research involving nanotechnology is conducted safely and responsibly, and that environmental considerations are incorporated into our technical innovations and product development.

Our vehicle interior air quality specifications consider the air quality in our vehicles, and our engineers also test the materials that come into direct contact with passengers for any allergen impacts. Many of our vehicles feature high-performance filters that keep out allergenic pollens. Having applied these specifications in our European vehicles, we are now phasing them in across other regions, starting with the United States.

In-Car Health and Wellness

We're exploring ways to use in-vehicle communication systems and other technology to help drivers to monitor their own health and wellness. For example:

- The Allergy Alert® app enables drivers to check pollen and other health-risk conditions with simple voice commands
- We are exploring how wearable devices, including smart watches and fitness bands, can measure indicators of driver stress such as heart rate, perspiration and skin temperature
- We are engaging with medical companies and auto insurers to see whether monitoring in-vehicle driver wellness could result in lower insurance premiums
- We are partnering with the Henry Ford Health System on a health and wellness app challenge

- Ford research teams in Dearborn, Aachen and Nanjing are partnering with university collaborators at the University of California, Berkeley, Peking University; and Tsinghua University to better understand the sources of emissions near roads and how to quantify them

1. Including hexabromocyclododecane (HBCDD) and decabromodiphenyl ether (decaBDE).
2. The date after which a substance of concern cannot be used in the E.U. without authorization from the European Chemicals Agency (ECHA).

Reducing End-of-Life Impacts

Automobiles are some of the most highly recycled consumer products in the world. The majority of materials contained in vehicles – particularly metals, polymers and fluids – can be recovered at the end of their useful lives.

In theory, end-of-life vehicles are 95 percent recoverable, but in practice, the cost in energy and labor to recover the final fractions manually often exceeds their value and the environmental benefits of doing so. We try to achieve the highest level of economically and environmentally viable recovery through the careful selection of materials, and by providing dismantlers with information on materials used and the best methods for treatment.

Take-Back Schemes

We've long been at the forefront of providing cost-free take-back networks for end-of-life vehicles (ELVs). There are currently networks for Ford vehicles in 19 E.U. markets, and we participate in a further 10. In the U.K., Ford was the first major manufacturer to establish a comprehensive plan that met the E.U. Directive, working with cartakeback.com to create a network of 190 facilities.

Alternative End-of-Life Treatments

Addressing end-of-life issues associated with mercury in older vehicles, we helped to forge a collaboration among the U.S. Environmental Protection Agency, state authorities, dismantlers, steelmakers and environmental groups to recycle mercury switches. With more than 10,000 participants in the scheme, over 7.1 tons of mercury had been recovered by the end of 2016. With this agreement set to end in 2017, we have forged a new agreement with the steelmakers to collectively manage mercury switch recovery through to the end of 2021.

To help divert plastic, foam and other nonmetal materials (known collectively as "automotive shredder residue" or ASR) from landfill, we support the development and implementation of treatment technologies that make the actual recycling of ELVs more economically and ecologically viable. We've also co-sponsored a [life cycle assessment](#) that showed the environmental benefits of using ASR for energy recovery.

Recycling During Servicing

At our U.S. dealership service centers, we recycle, reuse and reprocess the parts removed during servicing, such as headlights, bumpers and windshield-wiper motors. Dealers are charged for new parts, but are reimbursed if they are recycled through our Core Recovery Program. Parts that can be remanufactured are cleaned, machined and tested before being used in new vehicles; otherwise, they are broken down into small pellets and used to make new parts.

The scheme forms part of our voluntary Go Green Dealer Sustainability Program, to which around half of our U.S. Ford and Lincoln Mercury dealers have signed up.

> [Read more about our dealers](#)

Product Quality and Customer Satisfaction

Ford customers expect high-quality products and exceptional experiences that make their lives better. Our culture of collaboration and continuous improvement means that we can deliver great experiences as well as address any quality and satisfaction concerns quickly and effectively, and learn from every quality issue.

Our product quality vision

is to achieve best-in-world quality and productivity by driving the disciplined execution of common processes and standards.

Our product quality mission

is to deliver continuous quality and productivity improvements across all functions while delivering high-quality vehicles our customers want and value.

Exceeding Expectations, Every Step of the Way

We start thinking about people's lives and experiences years before a new model or service becomes available. Observing customers in their environments and daily lives, as well as imagining our future world, shapes our awareness of the mobility needs of people globally. Understanding our customers deeply over time points to the right products and services to offer. Focusing on the right experiences to offer provides us with criteria we can measure against, to gauge beyond how well things function to how well they serve people and make their lives better.

Managing Product Development

Our product development process always starts with the customer: understanding who they are, how they live and what they value in a vehicle. Then we identify and implement the technologies that will meet their evolving needs and expectations.

Engineers, designers and product marketing teams work together to finalize a vehicle concept and, once approved, it is brought to market using our Global Product Development System (GPDS), which combines the best production methods from across our global operations. GPDS also provides common metrics to increase efficiency and quality. Each vehicle must meet specific competitive and performance targets at every milestone in its development, including criteria for fuel economy, emissions and substances of concern.

We continually work to improve the quality of our products, using our quality policy ([Policy Letter 1](#)) to ensure that quality lies at the heart of everything we do, and our extensive global Quality Operating System (QOS) to manage the development and measurement of our manufacturing processes. This helps ensure that our vehicles meet or exceed customer expectations at every stage of vehicle development and manufacture.

Tracking Progress on Quality

We monitor product 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), our primary quality survey, tracks customer satisfaction and "Things Gone Wrong." It is implemented on our behalf every quarter by the market research and consulting firm Ipsos RDA Group. We also subscribe to J.D. Power and Associates' annual Initial Quality Study, Vehicle Dependability Study, and Automotive Performance, Execution and Layout (APEAL) Study, and track warranty claims and costs internally.

> [Look at our product quality and customer satisfaction data in more detail](#)

Enhancing the User Experience

Building on what we observe and understand from our customers, we use our User Experience (UX) Everyday Framework to help us develop new experiences that meet their needs and exceed their expectations.

A Warm Welcome

Lincoln has applied what it knows about its customers to develop the Embrace experience. Embrace automatically detects, welcomes and anticipates the driver's needs, with subtle and focused lighting where it's needed (from all-round lighting to a targeted "floormat"), seamless unlocking when entering the vehicle and ambient internal lighting set to individual preferences.

Are You Sitting Comfortably?

Inspired by private jets and high-end office furniture, we've introduced new Perfect Position Seats to the Lincoln Continental. The patented design allows the seat to be adjusted up to 30 ways, matching individual body shapes and weights for optimal comfort. High cushions extend and adjust independently – allowing one leg to remain at rest while the other engages the pedals – and a massage functionality helps reduce muscle fatigue in the upper legs and lower back.

Simple but Effective

Using what they learned about Lincoln customers, the team responsible for the drive mode control for the Navigator simplified its terrain management system. By defining "ideal" drive control behaviors – offering fine-grain control for occasional use by "experts" and a more intuitive, integrated control for everyday drivers – engineering and design teams were able to provide a solution that met the needs of both groups.

CASE STUDY

A Breath of Fresh Air

One area in which we've worked hard to ensure ongoing customer satisfaction is interior odor. Our engineers create a complex bouquet of more than 100 different materials to ensure that "new-car smell" is pleasant to as many customers as possible. Ford's approved "odor assessors" then test how heat and wear affect the odor of a car's parts.

Parts deemed to have an unpleasant odor are eliminated or replaced, or their formula is modified to fix the problem.

> [Watch a short video about the work of our odor assessors.](#)

Data Privacy and Security

The information that customers provide enables us to deliver great products and a personalized experience. We are committed to respecting customer privacy and using customer data responsibly.

Anticipating Customer Needs

By investing in data science and analytics, we can harness the true potential of technology, helping us deliver great products and services, and ensure a personalized experience. In doing so, we commit to protect customers' privacy and handle their data securely and responsibly as we explore new ways to deliver innovative solutions.

To enable us to develop new customer experiences and mobility services – through FordPass®, for example – we leverage the technology of partners such as cloud-based software leader Pivotal. One of the first programs to emerge from this partnership is a Dynamic Shuttle pilot service for employees at our Dearborn campus. This features smart ride-hailing technology that analyzes real-time data to maximize route efficiency and meet users' requests for ride sharing in a timely manner.

> [Read how we're using FordPass to transform how we interact with our customers](#)

Responsible Data Practices

Customers, employees and others care about the privacy and security of their data, and we take our responsibilities seriously. We have established a companywide governance infrastructure to drive a holistic approach to the privacy and security of data entrusted to us. This includes a number of policies and directives to ensure the continuing confidence of those who entrust us with their personal information. These policies require transparency, responsible data handling and use, and choice where appropriate.

We are also a founding member of the [Auto-ISAC](#) (Information Sharing and Analysis Center), established by the 12 members of the Auto Alliance to gather, analyze and share information about cyber-related threats and vulnerabilities.

Improving Vehicle Safety

Quality is critical to the safety of our customers and, therefore, to our responsibilities and success as a company. Safety continues to be one of the highest priorities in the design of our vehicles. We are committed to designing and manufacturing vehicles that achieve high levels of safety over a wide range of real-world conditions.

Our Approach to Vehicle Safety

"Our team is committed to enhancing vehicle safety through ongoing research and development of crashworthiness and innovative crash avoidance features. We encourage safe driving, with features such as MyKey® and Forward Collision Warning, and continue to educate and improve the skills of new drivers with our Ford Driving Skills for Life program."

Wayne Bahr

Global Director – Automotive Safety Office, Ford Motor Company

Our corporate safety policy, Policy Letter 7, outlines our commitment to design and build vehicles that meet or exceed applicable laws and regulations, while meeting the safety needs and expectations of our customers. In line with our policy letter, Ford is continuously working to enhance the safety of our products, a fundamental aspect of our [Quality Operating System \(QOS\)](#).

We conduct engineering analyses, computer simulations and crash testing to evaluate the performance of vehicles and components at a number of sites around the world.

We have state-of-the-art **crash-test facilities in Dearborn** in Michigan, Merkenich in Germany and Dunton in the U.K.

In Dearborn, we have a **motion-based driving simulator**, VIRTTEX (VIRtual Test Track Experiment), to research advanced driver assist features, human-machine interface (HMI) concepts, and other driving-related human factor topics such as drowsy driving and distracted driving.

We are also researching driver assist technologies, as well as looking at connectivity, mobility and autonomous vehicles, at our **Research and Innovation Centers** in Dearborn, Michigan, and Palo Alto, California.

In addition to meeting or exceeding regulatory requirements, our processes, tools and facilities confirm that our vehicles align with our own stringent internal guidelines on safety design, as well as Ford-specified levels of performance for Public Domain tests. We regularly re-evaluate and update these guidelines as appropriate.

Public Domain Ratings

Public Domain rating programs vary around the world, each having unique testing protocols and evaluation criteria. Among other consumer advocacy groups, organizations such as New Car Assessment Programs (NCAPs) and insurance-sponsored organizations that rate vehicles for safety exist globally. NCAPs, which have traditionally included vehicle crashworthiness ratings, are increasingly introducing pedestrian protection assessments along with driver assist and crash avoidance technology evaluations.

NCAPs around the world are continually being updated and often use different evaluation procedures, making it increasingly difficult to achieve the highest ratings. This disparity in what is evaluated, and the procedure or method used, can lead to different ratings for the same vehicle across regions. These inconsistencies pose additional challenges for global automotive companies like Ford, and may even require us to implement unique vehicle designs in different markets.

Nonetheless, we continue to get high marks for vehicle safety in key public and private crash-testing programs (see below for latest data, and in [customer satisfaction and quality surveys](#)).

Global Safety Public Domain Organizations

Global	Global NCAP
North America	IIHS
North America	NHTSA
Latin and South America	Latin NCAP
Europe	Euro NCAP
Russia	ARCAP (website not available in English)
China	CNACP (website not available in English)
Japan	JNCAP
Korea	KNCAP
South East Asia	ASEAN NCAP
Australia and New Zealand	ANCAP
India	BNVSAP (expected to launch October 2017)

Vehicle Safety Highlights

Ford continues to receive high marks and accolades for vehicle safety in a number of the industry's key third-party crash-testing programs. Our highlights include:

- As at March 2017, Ford leads all brands with 11 valid 5-Star ratings, the highest possible Overall Vehicle Score in the **New Car Assessment Program (NCAP)** of the U.S. National Highway Traffic Safety Administration (NHTSA)
- Ford has seven **Euro NCAP Advanced Awards** for innovative technologies, and six Best in Class Awards from Euro NCAP, more than any other OEM
- We received 5 Stars on all three vehicles tested for **CNCAP** ratings in 2016

› [Examine our vehicle safety performance in more detail](#)

Driver Assist Technologies

Sixty years ago, we became the first automaker to offer factory-installed safety belts, and our legacy of safety innovation endures to this day. We continue to roll out a range of technologies designed to enhance vehicle safety and help customers drive more safely.

Our Approach to Automotive Safety

Ford views automotive safety holistically, and actively works this approach into all areas of our business, from vehicle design and manufacturing to operator behavior and the motor vehicle environment.

We continue to implement innovations that enhance vehicle safety. We are also working on vehicles that communicate with each other and with the world around them, and share learnings with colleagues who are working toward our vision of an [integrated transportation ecosystem](#).

A variety of Ford technologies are available to help customers drive more safely and to alert them to a potential collision. These driver assist systems can also aid with routine driving tasks to reduce demands on the driver.

Our vehicles offer a range of driver assist features and semi-autonomous technologies that use radar, sonar and cameras to see, sense and interpret the environment. The very latest driver assist technologies, listed here, are available on specific vehicles in certain markets:

- **Speed Assist:** Adjustable Speed Limiter Device; Traffic Sign Recognition; Intelligent Speed Assist; Adaptive Cruise Control (ACC)
- **Braking and Collision Avoidance:** Active City Stop; Forward Collision Warning With Brake Support; Pre-Collision Assist With Pedestrian Detection
- **Lane Management:** Lane-Keeping System; Driver Alert System
- **Vision and Visibility:** Blind Spot Information System with Cross-Traffic Alert; Rearview Camera
- **Parking:** Active Park Assist; Enhanced Active Park Assist
- **Other Technologies:** Auto Hold; Hill Start Assist; Curve Control

Our Latest Technology

Developing new systems is part of our commitment to triple our investment in developing driver assist technologies. New features that are now available include the following:

Return to Park

Available on the 2017 Ford Fusion, the Return to Park feature uses data from a network of sensors to detect conditions that indicate a customer's intent to exit the vehicle. The smart technology can automatically shift to park, even if the driver forgets; for example, if the vehicle is turned off, or if the driver's safety belt is unlatched and the driver's door is opened when the vehicle is stationary.

Pedestrian Detection

We have introduced new technology that enhances the current Pre-collision Assist with Pedestrian Detection that can automatically brake for pedestrians, both in daylight and at night. This advanced Pedestrian Detection system scans the road and pavement ahead for people already in, or about to step into, the road ahead, and can automatically apply the brakes if it detects an imminent collision and the driver doesn't respond to initial warnings. Later this year, the advanced Pedestrian Detection system will be introduced on the next-generation Fiesta in Europe, while in North America, it will debut on the 2018 Ford F-150 and 2018 Ford Mustang.

ACC Stop and Go

ACC Stop and Go is a new semi-autonomous technology that "piggybacks" on the existing adaptive cruise control feature, and can help drivers experience less stress on the road. When activated, it automatically accelerates and brakes for the driver while maintaining a safe distance from the vehicle ahead. If the car stops for more than three seconds, the driver can tap the resume button or accelerator and the car returns to its preset speed. ACC Stop and Go has been added to the 2017MY Continental and Fusion/MKZ.

BLIS (Blind Spot Information System)

To help change lanes when pulling a trailer, the 2017 F-150 Raptor offers the BLIS (Blind Spot Information System) with trailer coverage, which extends the blind spot zone range behind the vehicle to include the trailer. And our 2017 Super Duty features Trailer Reverse Guidance with cameras fitted in the front grille, tailgate and side view mirror.

What's Next in Driver Assist Technology?

Ford's driver assist technologies have the potential to improve safety today, and form the building blocks for an autonomous future tomorrow. We are currently testing fully autonomous vehicle technology in real-world conditions, as well as implementing key semi-autonomous technologies across our entire portfolio.

Our Latest Technologies

Evasive Steering Assist helps drivers steer around stopped or slower vehicles to avoid collisions. Designed to operate at city and highway speeds, it uses radar and a camera to detect slower-moving and stationary vehicles ahead, and provides steering support to enable drivers to avoid a vehicle if a collision is imminent. The system is activated if there is insufficient space to avoid a collision by braking and the driver initiates evasive action.

> [Watch a short video about Evasive Steering Assist.](#)

Wrong Way Alert technology uses a windshield-mounted camera and information from the vehicle's navigation system to offer customers visual and audio warnings should they begin driving the wrong direction against traffic.

> [See how the Wrong Way Alert works.](#)

Another of our new technologies, **Traffic Jam Assist**, helps the driver keep the vehicle centered in a lane, plus it brakes and accelerates to keep pace with the vehicle in front.

> [Introducing Ford Traffic Jam Assist.](#)

We are also conducting research with a variety of public, private and academic entities to progress toward a future in which autonomous and connected vehicles communicate with one another, and with the road infrastructure, to help avoid collisions and reduce congestion:



Technical Challenges Surrounding Automated Driving

- Collaborating with the University of Michigan, Stanford University, Automated Driving Applications and Technologies (AdaptIVe)
- Lead contributor to the Crash Avoidance Metrics Partnership (CAMP) Automated Vehicle Research report, commissioned by NHTSA



Practical and Policy Challenges of Connected Vehicles

- Part of Vehicle Infrastructure Integration Consortium (VIIC), a group of 10 automakers and the U.S. Department of Transportation, looking at security and privacy, the allocation of risk and liability, and the funding of necessary infrastructure



Vehicle-to-Vehicle Safety Communication Systems

- Co-leading a group of eight automakers through CAMP



Vehicle-to-Infrastructure Applications

- Leading a separate consortium, working with the Federal Highway Administration



Cyber Security

- Developing Automotive Cyber Security Best Practices alongside members of the Auto Alliance and Global Automakers, and in conjunction with the Auto-ISAC



Driver Distraction

- Ford continues to invest a significant amount of time and resources researching driver distraction. Through partnerships with universities and organizations such as the AAM, we have been focusing on analyzing data from large-scale naturalistic driving studies (NDS)

> [Read our front page story about how we're helping drivers make good decisions behind the wheel](#)

Occupant Protection

Our commitment to advancing vehicle safety includes conducting research and developing technologies that further protect occupants and other vulnerable road users in a variety of situations.

Our Current Technology

Many factors influence a vehicle's crash performance, including its ability to absorb energy on impact and the use of passive safety equipment such as safety belts and airbags.

Safety belts remain the most effective and important vehicle safety technology available. In addition to traditional safety belts, Ford offers rear seat inflatable safety belts, which incorporate airbag technology to help reduce the risk of head, neck and chest injuries for rear passengers. We have also patented technologies that allow airbags to be placed in other locations inside the vehicle, such as knee airbags for front passengers.

We are using more advanced and ultra-high-strength steels, aluminum, plastics and composites in vehicle structures to maintain high levels of safety crash performance while reducing vehicle weight and improving fuel economy.

What's Next in Occupant Protection?

We collaborate with other automakers on precompetitive projects to enhance the safety of vehicle occupants. The results from these joint projects may have a broad impact and are often published in peer-reviewed journals and other scientific publications.

We collaborate with General Motors (GM) and Fiat Chrysler Automobiles (FCA) through the various safety-related working groups and committees of the U.S. Council for Automotive Research (USCAR). We also collaborate with other automotive manufacturers through the Alliance of Automobile Manufacturers (Auto Alliance), the Society of Automotive Engineers (SAE) International and the International Organization for Standardization (ISO).

We are also participating in joint projects on lithium-ion batteries and lightweight materials with the Department of Energy (DOE), software vendors and suppliers. We collaborate with universities in many areas through our Alliance partner universities¹ and by awarding grants through our University Research Program (URP).

Research into Occupant Protection

Our ongoing vehicle safety and occupant protection research includes the following examples:

- Using real-world crash data and developing computer models to estimate the effects of demographic trends (e.g., occupant age and weight) and vehicle characteristics (e.g., size and weight) on future vehicle safety
- Developing and using advanced human body computer models that reflect changing global demographics to investigate the specific needs of elderly and obese occupants, and to research possible countermeasures

STRATEGY AND GOVERNANCE

CUSTOMERS AND PRODUCTS

OPERATIONS

PEOPLE AND COMMUNITIES

PERFORMANCE AND DATA

- Working with industry to evaluate the biofidelity, repeatability, reproducibility and durability of next-generation anthropomorphic test devices (ATDs) – including two mid-sized ATDs for testing front and side impacts – so that they more closely simulate the responses of human occupants in crashes
- Ensuring emerging [alternative fuel technology systems](#) perform as intended during a vehicle crash
- Under the USCAR partnership and in collaboration with GM and FCA, we conducted a literature research and meta-analysis project on crash avoidance technologies, including but not limited to advanced driver assist technologies such as autonomous emergency braking (AEB), lane departure, night vision and advanced lighting
- Along with USCAR, we have continued the collaboration with Sandia National Laboratories (SNL) and the National Renewable Energy Laboratory (NREL) to conduct research and crash testing of live lithium-ion batteries to evaluate their safety performance
- With the DOE, we are evaluating the lightweighting of materials used in traditional automotive manufacturing to improve fuel economy while maintaining crashworthiness. Different commercial CAE (computer-aided engineering) crash codes are being evaluated for materials such as boron, carbon fiber and magnesium, while considering the implementation of new crash modes such as the proposed frontal oblique impact test being considered by NHTSA
- We are researching nano-liquid foam technology and its potential future applications in collaboration with Michigan State University
- We are developing new state-of-the-art CAE and safety methods for process improvements, enhancement of computer simulation capabilities and to support virtual testing

Research into Autonomous Vehicle Safety

We have also initiated research projects with universities related to future autonomous vehicle (AV) safety. These include:

- Assessing occupant use cases and occupant sensing technologies with Purdue University
- Evaluating how AV technologies may affect the real-world crash scenarios and occupant protection with the University of Michigan
- Evaluating how driver assist features will affect the safety of the occupant and accident scenarios in the field with Virginia Tech
- Developing potential out-of-position situations for the new deployable restraints and seating configurations that AVs may enable with Virginia Tech

› [Read more about our work with connected and autonomous vehicles](#)

CASE STUDY

Enhancing Safety in Autonomous Vehicles

With 29 years' experience developing safety-related electronics for automobiles, Colm Boran manages Ford's Autonomous Vehicle (AV) Systems Engineering team. His current role involves specifying the company's SAE Level 4 AV system architecture, which Ford plans to introduce in 2021 in a commercial fleet offering ride-sharing, ride-hailing or package delivery services.

“Our development processes, test facilities and decades of launching various driving automation systems in millions of vehicles around the world are all being brought together to develop the Ford SAE Level 4 AV. This is designed to operate autonomously without a steering wheel or pedals, within a geo-fenced area.

To enhance driving safety, the development vehicle has a range of sensors to exploit different portions of the electromagnetic spectrum, helping the system operate in a variety of driving and climatic conditions, such as low sun, for example. Some go beyond human capability and can “see” equally well in complete darkness, beyond the range of the vehicle’s headlights. And unlike humans, the sensing system never gets distracted or tired.

These sensors are arranged to provide 360° coverage, scanning round the vehicle several times per second. This creates a highly detailed map of the roads and surrounding structures, helping the system determine its location with precision.

In addition, we are in the process of investigating various redundant sub-systems that maintain functionality during abnormal situations.”

Colm Boran

Manager – Autonomous Vehicle Systems Engineering, Ford Motor Company

1. University of Michigan, Massachusetts Institute of Technology, Stanford University and Rheinisch-Westfälische Technische Hochschule (RWTH) Aachen University, Northwestern, Ohio State, Michigan State, Virginia Tech, Purdue, Katholieke Universiteit (KU) Leuven.

Post-Crash Response

Post-crash notification technology assists occupants in summoning assistance in an urgent situation through in-vehicle emergency call systems and can give first responders potentially life-saving information.

Automated Emergency Calls

Vehicles equipped with SYNC® in-car connectivity, which enables drivers to use cell phones and MP3 players through voice commands, also come with a call-for-help system called SYNC 911 Assist (in the U.S.) or Emergency Assistance (in other markets).

In the event of a severe crash where an airbag is deployed or the fuel pump is shut off, SYNC 911 Assist can make an emergency call using a paired/connected cell phone. This call can be initiated automatically, although a vehicle occupant can opt to cancel the call.

As well as providing the emergency operator with a GPS location, SYNC Enhanced 911 Assist can also provide data such as impact velocity, crash type, whether multiple impacts were sustained, safety belt usage for seating positions with belt reminders, and whether airbags were deployed. Such information could help emergency responders understand the severity of the incident and dispatch the most appropriate response. Enhanced 911 Assist is currently available on vehicles in the U.S. and China that are equipped with SYNC Gen 1.1 or Gen 3, and the offering has recently expanded to include Brazil.

Alerting Passers-By

The SOS-Post Crash Alert System™, available on most Ford and Lincoln vehicles, alerts passers-by and first responders to a vehicle's location. In the event of airbag or safety belt pre-tensioner activation, it automatically starts the hazard lights and, in non-European vehicles, sounds the horn. The system also sends a signal to unlock the vehicle doors to aid exit or access to first responders.

Encouraging Safer Driving

To us, driver safety is not just about making safer vehicles. We're also encouraging safer behavior behind the wheel through a range of programs around the world, including our flagship Driving Skills for Life (DSFL) initiative.

Ford Driving Skills for Life

[Ford Driving Skills for Life \(Ford DSFL\)](#) was established in 2003 by Ford Fund, in partnership with the Governors Highway Safety Association (GHSA) and a panel of experts, to teach newly licensed drivers the

necessary skills for safer driving, and the importance of making good decisions behind the wheel. The core curriculum – vehicle handling, hazard recognition, driver distraction, and speed and space management – is delivered through hands-on courses, classroom material and the Ford DSFL website, which includes an interactive training center (“The Academy”).

As we expand the program, we adapt it to suit different regions. In North America and Europe, the Ford DSFL programs help teenagers – the primary age group of first-time drivers – drive more safely. For example, the Ford DSFL National Tour delivered free hands-on training sessions in 20 U.S. states during 2016. Meanwhile, in many Asian, Middle Eastern and African markets, where the number of new drivers is increasing rapidly as more people are able to afford vehicles, Ford DSFL is aimed at novice drivers of all ages.

› [See how we're delivering Ford's DSFL program around the globe](#)

Progress in 2016

Our global reach spread further in 2016 to 150 markets around the world, with first-time programs in Finland, Poland, Korea, Kenya, Nigeria and Uganda; Hungary and Norway will be added in 2017.

In 2016, we delivered free hands-on, online and classroom-based safety training to 160,000 participants around the world.

Now in its 14th year, Ford DSFL had reached more than 1 million young people and newly licensed drivers in 35 countries at the close of 2016. This includes 200,000 people attending free, behind-the-wheel training and 800,000 people taking The Academy's online training modules, and equates to an investment of nearly \$60 million in promoting safety on the road.

Addressing Driver Distraction

Ford conducts a significant amount of research into driver distraction, both on our own and through partnerships with universities and organizations such as the Alliance of Automobile Manufacturers (Auto Alliance), to help make driving safer for everyone. Studies have demonstrated the importance of having drivers keep their hands on the wheel and their eyes on the road, informing the development of some [driver assist technologies](#) such as Forward Collision Warning, Automatic Emergency Braking, lane-keeping systems and SYNC®, which permits hands-free, voice actuation of several phone, navigation and audio features.

According to the U.S. National Highway Traffic Safety Administration (NHTSA), approximately 18 percent of all motor vehicle driver deaths involve drugs other than alcohol, such as cannabis and cocaine.

Driving Under the Influence...

To educate teens and new adult drivers about the dangers of driving while under the influence of alcohol or drugs, we have worked with the Meyer-Hentschel Institute in Germany to produce tailor-made “Drink Driving Suits” and “Drug Driving Suits.” Students attending Ford DSFL driving clinics during 2016 got to try both suits to understand how being impaired can slow movement, reduce reaction times, and affect vision and coordination.

In Europe, alcohol is a factor in a sixth of road accident fatalities.

› [See the “Drink Driving Suits” in action.](#)

› [See the “Drug Driving Suits” in action.](#)

...Even the Next Day

Drink driving is now one of society's biggest taboos but hitting the road the next morning can be just as dangerous. Even when drivers are no longer over the legal alcohol limit, drivers are likely to be sleep deprived and have slower reaction times.

That's where the “Hangover Suit,” again developed by the Meyer-Hentschel Institute, comes in. Weighing more than 17 kg, the suit – currently available on Ford DSFL courses in Europe – consists of a special vest, wrist and ankle weights, weighted cap and goggles, and headphones. Together, these simulate the classic hangover symptoms of fatigue, dizziness, sensitivity to sound, a throbbing head and difficulty concentrating.

Ford supports and contributes to the Automotive Coalition for Traffic Safety (ACTS) participation into DADSS (Driver Alcohol Detection System for Safety) research, aimed at developing a non-intrusive and robust system to support NHTSA's initiative to reduce drunk driving.

Anatomy of a “Hangover Suit”

Ford's “Hangover Suit” simulates all the classic hangover symptoms of a throbbing head, feeling tired and weak for the person wearing it.



1. Vision impaired glasses

Give you double vision, decreasing concentration and hyper-sensitivity to light

2. Cap

Together with goggles, stimulate dizziness and a blinding headache

3. Headphones

Play pulsating sounds to mimic a migraine headache

4. Body vest and ankle weights

Affect balance and slow movement, especially when worn on the opposite limb to the wrist weight

“There is a lot of social pressure to prevent those who may be tempted to drink drive after a night out, but those who drive the morning after often are traveling alone. The “Hangover Suit” shows how debilitating a hangover can be and the risk that driving in that condition can present to all road users.”

Jim Graham

Manager, Ford Driving Skills for Life

› [See how the Ford “Hangover Suit” demonstrates the dangers of driving while hungover.](#)

Giving Teen Drivers a Helping Hand

A new report from the GHSA, funded by a grant from Ford Fund, shows that while much progress has been made in reducing teen driver-involved traffic crashes and deaths over the past decade, teen drivers are still 1.6 times more likely to be involved in a fatal crash than their adult counterparts, and teen-involved fatal crashes increased by 10 percent in 2015.

The report, [Mission Not Accomplished: Teen Safe Driving, the Next Chapter](#), also reveals that while great progress has been made at reducing younger teen driver deaths (ages 15–17), more needs to be done for those aged 18–20. It also provides recommendations for actions that can be taken.

For our part, we've developed the Ford MyKey® system to help parents encourage their teenagers to drive more safely. Available on millions of Ford and Lincoln vehicles, the programmable key can:

- Limit the vehicle's top speed and provide speed-limit alert chimes
- Initiate a “Do not disturb” feature to redirect incoming phone calls and text messages
- Activate Belt-Minder® to chime every minute and mute the audio system until both front occupants are buckled
- Limit the maximum audio system volume to help with hearing nearby first responders
- Prevent safety and driver assist systems from being disabled

› [Read our front page story about how we're helping drivers make good decisions behind the wheel](#)

OPERATIONS

The world doesn't stop at our fence line. Nor does our environmental responsibility, so we're working with suppliers as well as in our own operations to tackle big issues like climate change.

IN THIS SECTION

- [Energy Use and Greenhouse Gas Emissions](#)
- [Water Use](#)
- [Waste Reduction](#)
- [Environmental Impact of Our Suppliers](#)

Teaming on Environmental Challenges

Ford owns and operates 62 worldwide manufacturing plants, where we directly manage and control our impacts.

We also rely on the goods and services we buy from other companies, such as freight providers and components manufacturers.

In Ford-owned and operated facilities across the globe, we manage our impacts directly because they're under our control. However, supplier companies such as component manufacturers also have an environmental footprint. In relation to those supply chain impacts, Ford has a responsibility also – to be a partner for progress with our suppliers – through engagement, influence, capability-building and sharing best practice. It's the right way to create win-wins for our company, the businesses we work with and the environment.

Focusing on Key Impacts

Both in our facilities and in the supply chain, we focus on changes and improvements that are beneficial for the environment, our company and communities.

Climate-related impacts are key priorities and we have comprehensive programs in place for increasing energy efficiency, cutting greenhouse gas (GHG) emissions, reducing waste and managing water resources.

How We've Gone Further



Led the way on water

Ford is the only North American company in the "consumer discretionary" category to earn CDP's highest honor for corporate water stewardship



Continued to focus on emissions reduction

Almost 53% reduction in worldwide facility GHG emissions Since 2000



Invested in closed-loop manufacturing processes and sent less waste to landfill

49% reduction in volume of manufacturing waste sent to landfills Compared to 2012



Supply chain sustainability

Partnership for A Cleaner Environment (PACE) includes 40+ strategic suppliers – able to impact nearly 1,100 sites

Energy Use and Greenhouse Gas Emissions

Maximizing efficiency and reducing energy waste are key to lowering our facility greenhouse gas (GHG) emissions. We also look for opportunities to reduce our footprint through renewable energy.

OUR APPROACH

Driving Down Facility GHGs



Reducing Energy Waste

Using less energy to make our vehicles and driving GHG reductions



Investing in State-of-the-Art Facilities

Quality, safety and lean production



Participating in GHG Emissions Reporting and Trading

Supporting mandatory and voluntary schemes globally

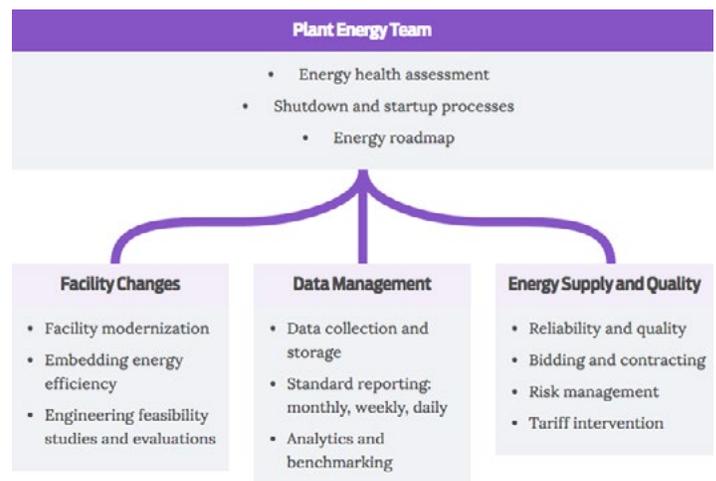


Ensuring Compliance

Adhering to national carbon reduction requirements

Increasing Energy Efficiency

Our Energy Management Operating System (EMOS) is a comprehensive approach focusing on facility improvements, data management and the supply of energy to our manufacturing plants.



OUR PERFORMANCE**GHG Emissions From Our Facilities**

Our global goal is a 30 percent reduction in GHG emissions per vehicle produced between 2010 and 2025. We are on track to meet this goal and in 2016 we achieved a further reduction compared to the previous year.

Our performance

Reduction in CO₂ emissions per vehicle produced:

52% reduction per vehicle, 2000 to 2016

4% reduction per vehicle, 2015 to 2016

› [See the full data tables for Operational Energy Use and CO₂ Emissions](#)

Average Energy Consumption

We met our global goal in 2015 – to reduce facility energy consumption on a per-vehicle basis by 25 percent compared to 2011 – and exceeded that reduction further in 2016. We continue to focus on driving efficiencies in our worldwide facilities.

Logistics Operations

Our logistics operations provide the safe and efficient transport of parts and components from our suppliers to our manufacturing plants (“inbound” freight), and of finished vehicles from our plants to our dealerships (“outbound” freight).

Managing Logistics

With activities coordinated regionally, our Material Planning and Logistics (MP&L) organization is responsible for designing and operating our global transportation networks, and devising high-quality and efficient packaging to protect materials in transit. Its environmental initiatives are focused on:

- Compliance with regulatory standards, including ISO 14001 compliance and updating our fleets in line with the latest requirements
- Quantifying and reporting our freight GHG emissions
- Reducing our emissions by improving our transportation and network efficiencies
- [Optimizing our packaging processes](#)

Reporting Freight GHG Emissions

Understanding, quantifying and reporting our freight emissions helps us understand our overall environmental impacts, and prioritize ways to minimize our total life cycle carbon footprint. We work closely with our logistics partners to collect data from across our networks and collate it in a global performance scorecard.

We continue to expand the scope and accuracy of our reporting. For example:

- We actively supported the development and road testing of the Greenhouse Gas Protocol Scope 3 reporting standard (see below)
- We account for a full range of GHG emissions, including nitrous oxide and methane, as well as CO₂
- We work with industry bodies and standards agencies to promote the ongoing development of improved reporting methods and develop best practices

Assessing and Reporting on Indirect Emissions

The [Scope 3 GHG Emissions Standard](#), developed by the [World Resources Institute \(WRI\)](#) and [World Business Council for Sustainable Development \(WBCSD\)](#), provides a framework for reporting upstream and downstream emissions in the value chain, from raw material extraction to end-of-life disposal or recycling. We helped in its development and use its methodology for reporting freight emissions from our logistics networks.

As reporting methods have evolved, we have adapted our calculations to take account of other GHGs (using the “CO₂ equivalent” approach) and emissions resulting from the production and generation of the fuel and other energy we use (“well-to-wheel” emissions).

We work with the Automotive Industry Action Group (AIAG) in North America to encourage others in the industry to adopt these standards. In Europe, we have worked closely with both the U.K. Department for Transport and Odette International, the European automotive supply chain standards organization, in writing guidance on measuring and reporting GHG emissions.

Reducing Freight Emissions

Freight emissions are influenced by a wide range of interrelated factors, including the mode of transport, the efficiency of the equipment used and the design of the freight network. We seek to achieve emissions reductions in three main ways, as shown below.

Improving Freight Efficiency

We manage our own freight networks to provide more control over route planning.

We use regional distribution centers to coordinate deliveries.

We use “milk run” routes, where one truck visits several collection points, to minimize the number and length of journeys.

By improving load density – the volume of freight on a trailer – we can have fewer trips and reduce fuel consumption.

Best Practice Technologies

Where we operate our own transport fleets, we use the latest engine technologies and equipment modifications such as fixed deflectors and speed limiters.

Our drivers are all trained in fuel-efficient driving techniques.

The latest packaging and equipment designs allow extra loads to be carried, such as improved vehicle stacking on rail wagons.

Alternative Transport Modes

Maximizing the use of rail and river transport reduces both CO₂ emissions and traffic congestion.

We use multimodal solutions such as “SWAP bodies” – standard freight rail containers that can be lifted onto dedicated road trailers – to increase the use of rail freight across Europe.

We increasingly use short sea trips for vehicle deliveries to avoid road transport.

› [Read more about how we're helping our suppliers manage their environmental impacts](#)

Water Use

Water is far more than an environmental concern. At Ford, we recognize the human right to clean, affordable drinking water and adequate, accessible sanitation, and focus on responsible water stewardship in our operations.

**OUR APPROACH
Water Matters**

According to WaterSense, an EPA partnership program, less than 1 percent of all the planet's water is available for human use and the remaining 99 percent is salt water in oceans, freshwater frozen in polar ice caps or water inaccessible for practical use.

This is one of the reasons we are managing this critical resource.

› [Watch a video about Ford's approach to managing water use.](#)

We're Part of the Collective Effort to Find Solutions

Ford has joined with over 140 companies worldwide to endorse the UN Global Compact CEO Water Mandate. Our water strategy aligns with the six core elements of the mandate, which focuses on:



Direct Operations



Supply Chain and Watershed Management



Collective Action



Public Policy



Community Engagement



Transparency

We Work Inside and Outside Our Fence Line

Water issues like scarcity and pollution intersect with climate change risks and affect communities and businesses everywhere. Ford operates in water-stressed regions of the world such as India. It's our responsibility to conserve water and widely promote its stewardship.

Since our earliest focus on water (we began to set targets as far back as 2000), we have broadened our efforts and are working in our communities and supply chain to address water challenges:

In Our Communities

The winning project in the inaugural Bill Ford Better World Challenge is focused on the human right to water. Centered in a rural area of Thailand, the project benefits from a \$200,000 grant and the participation of hundreds of Ford volunteers working with local communities, to improve access to clean water in rural schools and neighborhoods.

> [Read more about the Thailand Clean Water Community Project](#)

With Our Suppliers

Through our Partnership for A Cleaner Environment (PACE), we offer participating suppliers best practices and monitoring tools to help them track and achieve their own sustainability goals. In return, the suppliers report their environmental progress and share their own best practices.

Ford suppliers participating in our voluntary PACE program are on track to save an estimated **550 million gallons of water over the next five years** – enough to fill 837 Olympic swimming pools – according to data collected in 2016.

> [See more information about PACE](#)

OUR PERFORMANCE

We Continue to Reduce Our Water Use in Vehicle Production

From 2000 to 2016, we saved over 10 billion gallons of water. That's enough to fill over 15,000 competition-sized swimming pools.

This saving was achieved through implementing our water strategy, introducing new technologies and developing our processes. We're continuing our program by rolling out real-time water metering to aggressively manage our use, and conducting water assessments to determine where new conservation measures can be applied.

In 2016, we continued our trend of continuous improvement with a further saving. For every vehicle we make, we now use 3.7 cubic meters of water (2015: 3.9 cubic meters) – that's 62 percent less water per vehicle produced compared to 2000.

Our Performance

62% reduction in water use per vehicle produced, 2000 to 2016

> [See the full data for Water](#)

Our Second "A" Grade for Water Conservation

Ford is one of only 24 A-listed companies (out of 600 assessed) in the CDP 2016 benchmark, and the only North American company in the "consumer discretionary" category.

"The business case for action to improve water security has never been stronger or more urgent. We congratulate Ford Motor Company for achieving a position on CDP's Water A List. The company is responding to market demand for environmental accountability and at the same time making progress toward achieving a water-secure world."

Morgan Gillespy

Head of Water at CDP

> [Read why water is vital to climate action in CDP's Global Water Report 2016 \(written on behalf of 643 investors with \\$67 trillion in assets\)](#)

Looking Ahead: Our Water Strategy to 2020

We updated our long-term water strategy in 2016, using results from water futuring work, which considered a number of "what if" scenarios, and CERES AquaGauge results. Aqua Gauge is a comprehensive assessment tool for evaluating corporate management of water risk. Our updated strategy reflects our focus on infrastructure, communication and collaboration; the priority we give to understanding water challenges in their local context; and our ongoing commitment to transparent reporting.

Having achieved our previous goal two years ahead of schedule, our water strategy sets out a new, aggressive target – to save an additional 30 percent of water per vehicle produced between 2015 and 2020 – representing a 72 percent reduction in water use per vehicle over that period. It's a first step toward achieving our aspiration to manufacture vehicles without withdrawing any potable (drinking) water for our processes.

Our 2020 Target

Reduce water use per vehicle produced by 30% from 2015 to 2020

CASE STUDY

Sanand Water Conservation, India

Our Sanand vehicle assembly and engine plants in India have one of Ford's largest and most advanced water and wastewater treatment facilities. After being treated, 30 to 35 percent of gray water from office washrooms, canteen and manufacturing operations is recycled for use in the paint shop and other processes.

We have invested in a fully automatic irrigation system, enabling us to use the remainder of the treated wastewater to maintain lawns and planting, further reducing our freshwater consumption. The system irrigates the green spaces at regular intervals depending on the climatic conditions.

100% of treated gray water at our Sanand facility is recycled and reused within the property.

These measures have saved 219,000 cubic meters of freshwater in 2016 and mean that there is zero wastewater discharge at the Sanand plants. We will continue to focus on ways to reduce freshwater consumption, including optimizing manufacturing processes and developing rainwater harvesting techniques.

Read more about how Ford plants across the globe are recycling and reusing water:

> [Water Stewardship at Our Chicago Assembly Plant](#)

> [Conserving Water in Brazil](#)

Waste Reduction

Ford has a five-year global waste-reduction plan, which details how the company will lessen its environmental impact.

OUR APPROACH

Aiming for Zero Waste to Landfill

When a facility is given landfill-free status, it means absolutely no manufacturing waste from the facility goes to landfills (see our current waste mix below).

We're focused on ensuring that even more of our plants and facilities become zero waste to landfill (ZWTL) sites, by implementing actions for waste reduction, including the following:



Our Focus on Waste Reduction

1. Continue investing in new technologies and programs that minimize waste
2. Standardize how waste is tracked and sorted at each point to make recycling and reuse easier
3. Identify the five largest-volume waste sources of waste to landfill at each facility
4. Partner with suppliers to increase the use of eco-friendly packaging
5. Enable local plants to bring about waste management change



Our Current Waste Mix

- Wastewater sludge
- Recovered paint solids
- Packaging waste
- Used oils and waste solvent
- Grinding swarf (metallic particles, abrasives and oils)
- Other wastes

OUR PERFORMANCE

Delivering Our Waste Targets

We set ourselves a key stretch goal – to reduce waste to landfill by 40 percent per vehicle produced between 2011 and 2016, reflecting our continuing efforts to reduce the amount of landfill waste associated with vehicle production.

Our Performance

65%+ reduction in waste to landfill on a per-vehicle basis, 2011 to 2016

> [See the full data for Waste](#)

As of the publication of this report:

- We reduced waste to landfill on a per-vehicle basis by more than 65 percent over the last five years, beating the target we set ourselves by a significant amount
- Ford facilities globally sent approximately 26,000 metric tons of waste to landfill – a decrease of 57 percent from 2011, even though production increased almost 21 percent in the same time period
- A total of 49 manufacturing facilities and 33 non-manufacturing facilities have achieved ZWTL status. These include the historical Ford Rouge Center and our North American World Headquarters:
 - [Ford Rouge](#) is the largest complex in our company to send no manufacturing waste to landfills and is keeping more than 14 million pounds of waste out of landfills each year
 - Located in Dearborn, Michigan; Oakville, Ontario; and Santa Fe, Mexico, our North American World Headquarters are diverting more than 240,000 pounds of waste from landfills

All our Canadian and Mexican manufacturing plants are ZWTL facilities.

CASE STUDY

Closed-Loop Aluminum Recycling

An expansive, closed-loop recycling system has been developed at our Dearborn stamping plant, and is now in use at our Kentucky truck and Buffalo stamping plants. It's helping us produce aluminum savings that are nothing short of monumental.

In these three plants alone, we are now recycling 5 million pounds a week of high-strength military-grade aluminum alloy – the material we use to make the Ford F-150, America's best-selling pickup for 40 years.

> [Meet Chip Conrad, the Ford stamping engineer who led the design of the system that enables Ford to recycle large amounts of aluminum, one "chip" at a time.](#)

The 5 million pounds of aluminum that we recycle every week in our Dearborn, Kentucky and Buffalo plants is enough to build 51 commercial jetliners, or more than 37,000 new F-Series truck bodies, per month.

How It Works

At the heart of this closed-loop recycling process is a large, automated vacuum system and more than two miles of tubing. As vehicle doors and fenders are stamped into shape, scrap material is shredded into chips, roughly the size of a dollar bill, which get sucked into the system and routed via a series of computer-controlled gates. The system automatically knows which of the four different grades of alloy is being stamped at a given time, then routes the material within seconds into one of four trucks standing by to send it back for reprocessing.

As we expand the use of aluminum in our product lineup, closed-loop recycling systems will be essential to the long-term viability of lightweight materials and meeting overall sustainability targets.

"Our ability to recycle leads to improved fuel economy and capability for our truck customers – and helps us build more affordable, high-performing, efficient vehicles."

Chip Conrad

Optimizing Packaging

Packaging has environmental impacts throughout its life cycle, including material use, transport emissions and waste disposal. We believe the best strategy for eliminating waste and optimizing efficiency is to use robust, durable, returnable packaging that can survive years of repeated reuse.

Reducing Our Overall Impact

Our own standard range of packaging not only protects its contents but also allows for maximum storage density during transportation. We always review the packaging of new parts before the full launch of any product, to assess opportunities for improvement.

Using standardized packaging makes packaging more interchangeable between suppliers and across programs. In many locations, we have contracts with packaging providers to collect and pool packaging for our suppliers. By enabling it to be forwarded to where it is next needed rather than having to be returned to the previous supplier, we have reduced our overall transport impact considerably.

We continually work to share best practice between regions and drive improvements in packaging. Ford's packaging guidelines require supplier-provided packaging to have a neutral or positive environmental footprint, achieved through zero waste to landfill and the use of 100 percent recycled, renewable or recyclable materials.

CASE STUDY

IsoBins for Long-Distance Ocean Freight

The biggest challenge in sustainable packaging has been its implementation for long-distance ocean freight. Traditionally, most automotive parts shipped by sea are packed in modular, cardboard boxes, but we're working to reduce this dependence on cardboard by using IsoBins: durable plastic containers specially designed for use at sea. This solution enables logistics providers to use the return leg for shipping material for other customers, rather than shipping back empty containers to the initial supplier.

Following successful trials, we have introduced them on our lengthy ocean supply routes between Europe and South Africa. We are now investigating their suitability for our transatlantic freight lanes.

Environmental Impact of Our Suppliers

We rely on thousands of suppliers to provide the materials, parts and services we need to make our products. Ford is committed to reducing the environmental footprint of our supply chain, as well as our vehicles and our operations.

A Complex Supply Chain

Building and maintaining strong, mutually beneficial relationships with a diverse range of suppliers helps us lower costs, improve quality and make progress toward our sustainability goals.

The automotive supply chain is one of the most complex of any industry. There can be up to 10 tiers of suppliers and sub-suppliers between an automaker such as Ford and the original source of raw materials used in the manufacturing process.

> [Read more about the diversity of our supplier base](#)

Our Supply Chain at a Glance



Indirect Suppliers

Suppliers of facilities, equipment, materials and services

Approx. 10,000 supplier companies



600+ commodities being managed



Engaging With Key Suppliers

One of the ways we maintain dialogue with our key strategic suppliers is through our Aligned Business Framework (ABF). This engagement helps improve quality, promote innovation, explore operational synergies and encourage common approaches to addressing areas such as ethical business practices, working conditions, manufacturing impacts and responsible sourcing.

For these suppliers, we have established a three-step process for managing sustainability issues:

- Ford verifies that ABF suppliers have a code of conduct aligned with [Policy Letter 24](#)
- ABF suppliers conduct internal training to ensure their employees understand and comply with their codes of conduct. Ford validates each supplier's processes to ensure ongoing alignment
- ABF suppliers are also required to extend our shared expectations to their own suppliers. Ford ensures that ABF suppliers can verify that their own supply chains are compliant with our standards and expectations

> [Download a list of our ABF production and indirect suppliers](#)

Our ABF Network

105 ABF suppliers, of which:

- 74% are production suppliers and 26% are non-production suppliers
 - 14% are minority-, veteran- and women-owned suppliers
- 78 production ABF suppliers, of which:
- 100% have codes of conduct aligned with our Policy Letter 24
 - 82% have robust systems governing their own operations and those of their supply chain

Understanding Our Suppliers' Impact

To better understand the greenhouse gas (GHG) emissions and water use of our supply base, we survey a selection of suppliers every year, using the CDP Supply Chain program's questionnaires. In 2016, we surveyed 242 production suppliers, as well as indirect suppliers of logistics and information technology services.

The selection of suppliers invited to participate is based on a combination of:

- The GHG or water intensity of their activities or the commodities they supply
- The geographic footprint of their operations, including those in water-stressed regions
- The strategic nature of their relationship with Ford

In 2016, 196 suppliers were also invited to respond to the CDP Water questionnaire, and 140 (71 percent) responded.

Together, these two questionnaires provide qualitative and quantitative information about our suppliers' management of climate risks, GHG emissions and water use.

CDP Supply Chain Survey Results

	2014	2015	2016
Number of suppliers surveyed	250	250	242
Response rate (%)	81	81	84
% of Ford's annual spend	57	64	66

We attribute our high response rate of 84 percent (average for all participating companies: 70 percent) to our ongoing support for suppliers through webinars, guidance documents and technical assistance. This includes one-day supplier training programs for calculating, allocating and reporting GHG emissions and a one-day program for water management and water use reductions, developed through the [Automotive Industry Action Group \(AIAG\)](#).

> [Visit the data section for more detail on supplier training](#)

The number of Ford suppliers integrating climate change into their business strategies and those reporting water-related targets continues to increase. In 2016:

- 82 percent integrated climate change into their business strategy (2015: 78 percent)
- 64 percent reported a water-related target or goal (2015: 41 percent)
- 64 percent reported having an emissions reduction target (2015: 66 percent)

The data obtained through these surveys has helped us to identify "hotspots" for GHG emissions and water use. These suppliers have been targeted to participate in our Partnership for A Cleaner Environment (PACE) program (see below).

> [Find out more about our impacts across our value chain](#)

Building Supplier Capability Through PACE

PACE is a supply chain sustainability initiative designed to reduce the collective environmental footprint of Ford and our supply chain.

Our goal is to share the leading practices we've implemented in our own manufacturing plants for reducing energy and water use, GHG and air emissions, and waste generation; this enables suppliers to replicate best practice, minimize their environmental impacts and report their sustainability performance. To extend the impact along the supply chain, we also encourage our Tier 1 suppliers to cascade the information down to their own suppliers.

The Five-Step PACE Process



Suppliers create multi-year roadmaps for improving environmental performance.



Baseline environmental data is recorded.



Successful approaches are selected and replicated.



Reductions in GHG and other emissions to air, energy consumption, water use and waste generation are measured, and progress against the baseline is reported.



Best practice examples, implemented by our suppliers or our own facilities, are updated and periodically shared.

Having been gradually extended over the last couple of years, PACE now includes more than 40 strategic suppliers with the potential to impact nearly 1,100 supplier sites in more than 40 countries.

> [Read our front page story about how we're working with suppliers through PACE](#)

Recognizing Supplier Excellence

We honor our suppliers for their outstanding performance and achievements with our World Excellence Awards. At our 18th annual ceremony, held at The Henry Ford Museum in Dearborn in May 2016, Ford recognized 57 suppliers from across the globe with awards in 11 categories.

> [Read more about our efforts to develop a more sustainable and ethical supply chain through our human rights and working conditions program](#)

> [See a full list of World Excellence Award winners](#)

Collaborating With Industry Partners

To magnify our efforts and encourage common approaches across the automotive supply chain, we participate in several industry forums.

- Ford founded and co-chairs the AIAG's **Environmental Sustainability Advisory Group**, which educates suppliers and manufacturers about environmental sustainability, and helps to develop common metrics, standards and benchmarks to improve the effectiveness of member companies' sustainability performance
- Ford has worked with the AIAG's **Greenhouse Gas and Environmental Sustainability Advisory Group** to integrate environmental sustainability, water benchmarking and GHG management issues across the industry
- Ford is a member of the [Suppliers Partnership for the Environment](#), a collaboration among automotive original equipment manufacturers (OEMs), their suppliers and the U.S. Environmental Protection Agency

PEOPLE AND COMMUNITIES

IN THIS SECTION

- [Our People](#)
- [Ford in the Community](#)
- [Dealers](#)

Together, our whole Ford family – employees, contractors and dealers – is committed to delivering profitable growth for all and strengthening our local communities.

As global demand for our products continues to rise, we rely ever more on the skills and talents of our dedicated employees around the world and the dealers who sell our vehicles.

Our business is only as strong as the communities in which we all live and work. It is therefore in our mutual interest to support them and invest in them, through financial contributions and volunteering efforts, to improve quality of life and maintain trust. This support is aligned with our ambition to build a better world.

“I want us to be the company that makes a difference in people’s lives – one that inspires its employees, delights its customers, rewards its shareholders and makes the world a better place.”

Bill Ford
Executive Chairman, Ford Motor Company

How We’ve Gone Further



Investing in Our Workforce

Created 28,000 jobs and invested \$12 billion in our U.S. plants Since 2012



A Safe, Healthy Workplace

Our lost-time case rate fell to 0.39



Creating an Inclusive Environment

Honored 40 teams and individuals from 12 countries through our annual Global Diversity and Inclusion Awards



Strengthening Our Communities

\$1.5 billion invested in civic organizations by Ford Fund Total to date



Supporting Good Causes

204,000 volunteering hours in 2016 Donated by the Ford Volunteer Corps



The Generosity of Our Dealers

\$100 million and 800,000 hours given to good causes and nonprofits U.S. Ford and Lincoln dealers, 2016

Our People

Our success depends on having a great place to work and a motivated, skilled workforce that meets, if not exceeds, our customers’ changing needs and expectations. Attracting the right people ensures a healthy talent pipeline, and providing effective training and development opportunities helps them achieve their potential. We remain committed to the health and safety of our people, and to advancing diversity and inclusion in our operations.

Talent on Six Continents

At the end of 2016, we employed 201,287 people in 71 facilities – approximately 2,200 more than at the end of 2015.

This growth in jobs is largely associated with investments in our existing facilities to expand production capacity, roll out new product launches and explore opportunities in emerging markets such as electric and autonomous vehicles.

> [See more detail about our workforce profile](#)

Investing in New Jobs Globally

Working with our partners, and through [collective bargaining agreements](#), we have created 28,000 jobs in the United States and invested \$12 billion in our U.S. plants during the past five years. And for every one of those jobs, we know a further seven employment opportunities are created in the local community among our suppliers and other associated industries.

Ford builds more vehicles in the United States and employs more hourly U.S. workers than any other automaker.

As part of our efforts to fully utilize the capacity we have in existing facilities, we’re investing \$700 million to transform and expand our Flat Rock Assembly Plant in Michigan, creating a new manufacturing innovation center and 700 jobs. Upgrades to our Livonia Transmission Plant and Ohio Assembly Plant will also create or retain 650 hourly jobs, while a further 150 jobs will be generated or secured with a \$145 million investment in the Cleveland Engine Plant. In March 2017, we also announced a \$1.2 billion investment in three Michigan manufacturing facilities.

Beyond the United States:

- We have announced a \$1.2 billion investment in our Canadian operations over the next four years; this will include a new research and development center in Ottawa, where 295 engineers will be hired to work on developing autonomous and connected vehicles
- We have invested \$170 million in our Silverton Assembly Plant in Pretoria, creating 1,200 new jobs at Ford South Africa and within our supplier network

Our Strategic Priorities

Our people vision

is to be recognized for world-class human resources (HR) solutions and business partnerships.

Our people mission

is to deliver high-impact, innovative workforce solutions and experiences that make employees' lives better.

Creating a Great Employee Experience

Throughout the world, we want Ford to be an employer of choice, offering competitive compensation and benefits, challenging and rewarding work, and the opportunity to be part of a leading company with a diverse workforce and great products. We will do this by:

- Creating a high-performing, diverse and inclusive workforce that is empowered, collaborative, engaged, safe and healthy
- Using employee-centric, high-value, integrated and streamlined workforce solutions that make employees' lives better
- Developing a great place to work with a strong employer brand

Building a Capable and Effective Workforce

To compete for potential recruits and ensure our future success, we have been standardizing, simplifying and integrating our process for managing talent. This has involved:

- Creating an organization that drives learning, teaching, coaching and mentoring to develop our people
- Fit-for-purpose development including functional, professional and leadership capabilities
- Agile and collaborative organizations and teams

To achieve these strategic priorities, we rely on a skilled and motivated HR team whose capacity to make employees' lives better has been enhanced through the use of world-class technology.

Making Employees' Lives Better

Mirroring our corporate purpose to make people's lives better by changing the way the world moves, we are making employees' lives better by changing the way we work. To help achieve this and meet our 2030 aspirations, we have begun to roll out a new human resources (HR) transformation program.

Changing the Way We Work

The automotive industry is rapidly evolving and the magnitude of change is unprecedented, due to factors such as rapid technological innovation, changing customer expectations, and an increasingly crowded and urbanized world.

Our response is to transform into an automotive and mobility company, a fundamental change that means transforming our people strategy too. So in 2016, our global HR organization embarked on a multi-year journey to transform how we work.

This program, called HRRev, seeks to use next-generation technology to streamline our people processes, making them simpler, more efficient and more meaningful to all who work at Ford.

A fundamental aspect of the program, driven from the top by our former President and CEO Mark Fields and our Group Vice President of Human Resources and Corporate Services Felicia Fields, is a shift in emphasis to improve the experience of our employees at work. It's a streamlined, employee-centric approach that aims to empower our people through collaboration and integration.

Scope of Transformation Program

40 countries



201,000+ employees



Approx. 1,700 HR employees



Approx. 300 major vendor relationships



Approx. 35 products and service areas



Approx. 15 technology systems



HRRev People Shifts

This more innovative mind-set is demonstrated in a range of "people shifts" as outlined below. We have identified four key areas where we believe we have a significant impact on our employees' experience, and are starting to develop processes and guidelines that are designed to increase emphasis on areas that need more attention.

Shifting the Emphasis of Our People Principles

Empowerment **Compliance-Driven** → **Expectation-Driven**



Highly Controlled → **Sharing**

Empowering our people to act appropriately without lengthy policies or complex rules, and promoting more sharing across the organization

Collaboration **Individual** → **Team**



Paternalistic → **Partnership**

A greater focus on high-performing teams and partnerships, with joint responsibility and accountability for our success

Employee Focus **"One Size Fits All"** → **"Fit for Purpose"**



Process-Centric → **Employee-Centric**

Seeking employees' opinions more frequently, to better understand their priorities and concerns, and create more solutions that are fit for purpose and employee-focused

Integrated and Streamlined **Lengthy Design** → **Agile and Iterative**



Complex Process → **Simplified**

Have more agile, iterative and uncomplicated people processes that focus on adding value

In support of this change in mind-set, we are transforming how we work across the company to drive business results. This includes how we:

- Attract, retain and develop talent through a more personalized employee experience
- Use the latest technology to improve processes, increase usability and accessibility, and provide analytics and insights to inform decision making
- Free up capacity and expertise to support high-value strategic business needs
- Leverage centralized Shared Service Centers to provide greater consistency and quality, achieve economies of scale and make us more responsive to the ever-changing business environment

The People Lab

To fully understand and address the challenge of transforming our processes, a group of HR leaders joined forces to benchmark and gather data from inside and outside the company. Based on their findings, we created a People Lab: seven HR employees from all regions and levels of the organization. The team’s task was to deeply understand employee feedback, explore best-in-industry practices and find ways to simplify and streamline our processes.

Rather than using pilot studies, their work involved devising experiments to address issues such as pay for performance and supervisor feedback. These were designed to follow a scientific method, involving hypothesis setting, testing and measuring results against expected outcomes, enabling us to get deeper insight into the user experience, observe behavior and scientifically test interventions to guide process design.

“The Lab was one of the most rewarding and challenging experiences of my career. Everything about it was unique: our approach, the data we leveraged, even our dialogue. Yet, what made it special was the shared passion that grew quickly out of our desire to make working at Ford better for everyone. The opportunities we identified will not only enable us to deliver on our business strategy, but also create meaningful and lasting impact for our employees for years to come.”

Kyle Worthing

HR Business Partner – The Americas; People Lab participant

Recognition for HRRev

In recognition of our efforts to make employees’ lives better through innovations in people practices, Ford was one of five leading organizations honored with the Next Practices Award by human capital research firm i4cp.

HRRev was also featured in the [2017 Deloitte Global Human Capital Trends](#) report, published by Deloitte (see “Lessons from the front lines”).

Employee Engagement and Satisfaction

Communicating With Our People

We use a range of channels to communicate with employees with different experience and interests in timely and efficient ways. These include: our intranet site and website; annual reports and corporate publications; social media channels; webcasts and executive Q&A sessions with senior management; labor-management committee meetings; “Town Hall” meetings; [Employee Resource Group \(ERG\) initiatives](#); and employee surveys.

Assessing Employee Satisfaction

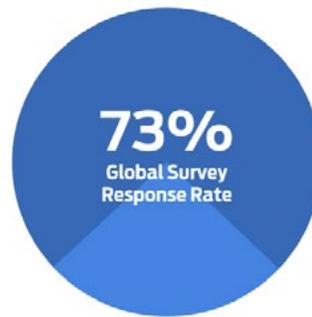
Each year, we conduct our Global Pulse Survey, through which our people are encouraged to provide honest feedback about their satisfaction with the company, their jobs and their workplace.

Managers and supervisors are given a report highlighting how their teams and/or plants responded to the Pulse Survey. These are intended to inform discussions and improvement plans, contributing to a steady increase in Pulse scores, an annual performance objective for many senior managers. The results are also benchmarked externally.

2016 Global Pulse Survey Results

This year marked a refresh of the Pulse Survey. We made changes to the content, manager reports and the cadence of the survey. Overall, employees are satisfied with the company and their workgroups. Results have improved year over year and we continue to exceed external benchmarks.

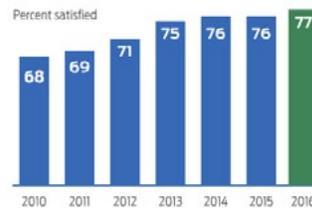
The Pulse is an important source of global feedback



- 2016 survey administered...**
- From November 7–28
- In 17 languages
- To salaried employees globally
- 2016 responses represent...**
- 44 countries
- 14 skill teams
- 6 business units
- 7,000+ work groups

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
- 85% of respondents are satisfied with their supervisor
- 81% 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.

<p>Opportunity to improve skills in the company:</p> <p>13 percentage points above benchmark</p>	<p>Satisfaction with information received about what’s going on in the company:</p> <p>13 percentage points above benchmark</p>	<p>Satisfaction with recognition for doing a good job:</p> <p>12 percentage points above benchmark</p>	<p>Feel valued as a company employee:</p> <p>11 percentage points above benchmark</p>
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2016 Employee Satisfaction Index



*Scores do not total 100% due to rounding.

> [See more detail about our employee engagement](#)

Health and Safety

We are committed to ensuring that our people stay safe and healthy. We have robust policies and practices in place throughout our operations to measure our health and safety performance, demonstrate progress and identify areas for improvement.

OUR APPROACH

How We Manage Health and Safety

Accountability for health and safety performance is established through business planning, policies and scorecards. Business operation and plant managers are responsible for health and safety in the operations they manage, and safety performance forms part of the scorecards of relevant salaried employees. Our president and CEO, our senior operating team, global Manufacturing Operating Committee and regional Occupational Health and Safety (OHS) committees all review safety performance regularly.

Our efforts are guided by our OHS policy, established through corporate [Policy Letters and Directives](#), and our global OHS standards cover all relevant issues, from workplace safety to ergonomics and occupational hygiene to toxicology.

Our Safety Operating System (SOS), part of our overall manufacturing strategy, provides for the health and safety of our employees, and most of our manufacturing facilities have joint union/management safety committees to guide, develop and implement safety programs.

Reinforcing Our Strong Safety Culture

Our safety vision

is to achieve no fatalities or serious injuries, and to protect and continually improve the health of our workforce.

Our strong safety culture relies on effective communication and reinforcement through a variety of channels, engaging all employees and contractors in understanding and adhering to safety programs and policies. We hold regular safety talks and occasional safety stand-downs at our plants to focus on key issues, and also use the START Card process to identify when to conduct pre-task briefings and safety assessments.

All employees are encouraged to alert management to every injury or hazard, so that we can take corrective actions and create a safer workplace for everyone. Should a significant incident occur, we can alert health and safety experts at our other facilities so that appropriate action can be taken if necessary.

An Increased Focus on Prevention

Our efforts to make safety a core value across our operations have gone beyond response, toward prevention.

We now use “leading” metrics, such as potentially serious incidents without injury and closure time for identified safety improvements by employees, in our safety scorecard. In 2016, we had 208 high-potential reported events that could have had serious consequences, but didn’t. Each incident was investigated, and we implemented a number of preventive measures.

Globally, we are always looking to utilize new technologies in an innovative way. In 2015, we created a global collaborative robot technical committee that includes cross-functional representation from engineering, operations, safety and our union partners. Our objective was to create a global standard to ensure the safe design and implementation of collaborative robot applications. Collaborative robots provide us with an innovative approach to reducing or eliminating risk factors that have been difficult to solve in the past. An initial pilot application was successfully launched in Thailand in 2015.

At the end of 2016, we were successful in implementing additional collaborative robot applications in India and the U.K., with further projects planned for introduction in North American manufacturing sites in 2017.

As well as striving to predict and eliminate risks during the design stage using “virtual manufacturing” technology, we rely on good relationships with our stakeholders to identify, analyze and eliminate other potential risks. We continue to collaborate with unions to help address unsafe behaviors, and maintain external relationships with regulatory agencies and professional organizations such as the U.S. Occupational Safety and Health Administration.

CASE STUDY

Robot Eases Employee Strain in Cologne

Employees assembling the Ford Fiesta at our Cologne Vehicle Operations in Germany are working hand in hand with a collaborative robot (co-bot). In the past, employees mounting shock absorbers had to lift 4.5 kilograms over their heads every 77 seconds.

Now, the co-bot automatically puts the screws and shock absorbers into position, eliminating the need for repetitive and strenuous lifting, and reducing the risk of back strain. The robot is flexible and adjustable so it can be customized to each individual employee, and can also adapt to changes in line speed.

[See how co-bots work alongside humans on our production lines.](#)

OUR PERFORMANCE

Our Safety Record in 2016

Every life is valued and precious, and any loss of life or serious injury in our facilities – whether it is a Ford employee, contractor, supplier or any other visitor – is unacceptable. Although we’ve made great strides in safety across our business, regrettably, in 2016, there were two fatalities among Ford employees – the first for seven years. One occurred in Europe and the other (a non-work-related act of violence) in North America; there was also one fatality among contractors working at our facilities. The circumstances were analyzed in detail and actions were taken to prevent future incidents of a similar nature.

Another key safety indicator, lost-time case rate, now stands at 0.39 cases with one or more days away from work per 200,000 hours.

Lost-Time Case Rate

	Cases per 200,000 hours worked		
	2014	2015	2016
Ford Global Rate	0.38	0.43	0.39
U.S. Motor Vehicle Manufacturing (NAICS 3361/SIC 3711)	1.9	1.6	NA¹

Data notes and analysis:

NA = Not available.

1. Annual data from the Bureau of Labor Statistics unavailable at the time of publication.

Benchmarking Our Performance

Internal benchmarking enables us to replicate best practices from around the business, and share the attributes that drive health and safety excellence. These are honored in our annual President’s Health and Safety Award program, which recognizes leadership and innovation in workplace health and safety, and supports the development of a robust safety operating system. Presented at a global and regional level, the awards include:

- Safety innovations in manufacturing and non-manufacturing operations, safety excellence and safety leadership
- Ford plants with the lowest lost-time case rates
- Our Health & Safety professional of the year and career achievement categories
- Lifesaving awards in recognition of emergency interventions

External benchmarking helps us to achieve best-in-class performance. We participate in multi-industry groups, including auto industry peers and companies from other sectors, which share information on safety performance and industry trends, and explore potential collaborations to address current issues.

> [See more detail about our health and safety performance](#)

EMPLOYEE HEALTH AND WELL-BEING

Tailored Offerings and Informed Choices

Our health vision

is to foster knowledgeable employees, engaged in their own health and well-being, to Go Further at work, home and into retirement.

The health and well-being of our workforce remains a priority for us and is a key driver of performance. Our mission is to support the ONE Ford plan by providing innovative, high-quality programs and services that empower employees to achieve health and well-being.

We tailor our offerings to meet individual and local priorities, and provide resources to help individuals make informed choices as they interact with the health care system. In 2016, 80 percent of our U.S. salaried workforce participated in our annual wellness requirements, which are designed to help our health plan participants to establish a relationship with a personal primary care physician, gain a better understanding of their own health status and receive appropriate preventive care.

To meet their annual wellness requirements, our enrolled employees and their spouses must be screened by their personal physician and complete an online health assessment. If an employee meets the wellness requirements, the employee (and their family, if enrolled) will achieve the Enhanced Benefit Level and enjoy reduced out-of-pocket costs when they receive medical care.

Around the world, the cost of health care insurance is significant, so helping our employees to avoid serious diseases and effectively manage chronic conditions has a positive impact on their quality of life and on our success. Promoting health among our employees also contributes to healthier communities in general, as good habits tend to be shared with friends and family.

Employee Diversity and Inclusion

We embrace diversity and inclusion at every level of the company, and take pride in a workforce that reflects the communities in which we live and work. The different backgrounds, opinions, experiences and perspectives of our employees make us a stronger business, and help to foster a truly collaborative workplace.

“We recognize that having a diverse and inclusive workforce allows us to leverage a wider range of innovative ideas to make our customers’ lives better.”

Felicia Fields

Group Vice President, Human Resources and Corporate Services, Ford Motor Company

HOW WE MANAGE DIVERSITY

Building an Inclusive Environment

Our diversity and inclusion vision

is to have an environment that fosters skilled and motivated people working together to drive innovation and deliver results in support of our core business and emerging opportunities.

As an equal opportunity employer, Ford considers all qualified applicants for employment without regard to race, religion, color, age, sex, national origin, sexual orientation, gender identity, disability status or protected veteran status.

We incorporate diversity throughout our enterprise to leverage our skills, drive business success and serve our communities. The inclusive environment also encourages our employees to recognize and respect colleagues’ differences, pursue professional and personal development, and maximize the benefits derived from a diverse workforce.

Diversity and inclusion is a collaborative effort requiring cross-functional collaboration within Ford, as well as with [dealer groups](#) and [supplier organizations](#).

Exemplifying our approach, Bill Ford, Executive Chairman, and Mark Fields, our former President and CEO, made a joint statement to employees in late January 2017, saying that the company did not support President Trump’s executive order banning those from seven Middle Eastern countries from entering the U.S. for a period of 90 days.

“Respect for all people is a core value of Ford Motor Company, and we are proud of the rich diversity of our company here at home and around the world. That is why we do not support this policy or any other that goes against our values as a company. We will continue working to ensure the well-being of our employees by promoting the values of respect and inclusion in the workplace.”

Bill Ford

Executive Chairman, Ford Motor Company

Our Five Focus Areas

Our diversity and inclusion efforts are aligned with five strategic areas of focus:



Leading the Way

Led by our CEO, our executive leadership team champions diversity and inclusion, integrating them into business objectives and human resources processes.



Diverse Workforce

Attracting, developing and retaining a diverse workforce is needed to succeed in our global marketplace. Our Employee Resource Groups (ERGs) are essential to this strategy. They seek to foster cross-functional connections, support mentoring and networking, and provide professional and leadership development opportunities for employees from particular ethnic backgrounds; veteran and military employees; employees with disabilities; female professionals; working parents; lesbian, gay, bisexual and transgender employees; and groups for employees of faith. Employees from all backgrounds are welcome to participate in any ERG. These voluntary, employee-led groups also enhance our ability to attract and retain a diverse workforce.



Respectful and Inclusive Workforce

We promote employee accountability for inclusion by communicating expected behaviors via our Intranet site and through training, and by highlighting the winners of [diversity and inclusion awards](#) in internal newsletters. Other resources include employee assistance programs, wellness initiatives, rooms for nursing mothers and meditation rooms.



Work-life Flexibility

Work-life flexibility creates a competitive advantage across our global, multi-generational workforce. Options including reduced and flexible schedules, job sharing, telecommuting, digital tools to improve productivity and communication tools are made available to many employees.



Strategic Partnerships

In collaboration with other agencies, our businesses around the world develop partnerships to promote diversity and inclusion within the communities and within the company:

- Working with the **Robert Clack School**, Ford in the U.K. provides inspiring interventions and initiatives to encourage children from the Dagenham area to aim higher. The partnership includes one-to-one mentoring, site visits, career support and work experience, as well as financial and practical support to assist students.
- UAW-Ford and **Wounded Warriors Family Support** provide a six-week training program in welding for U.S. military veterans at our Technical Training Center, preparing participants to pursue apprenticeships and entry-level positions in the automotive sector, as well as shipbuilding and construction.
- In June 2016, Ford launched a U.S. pilot partnering with **Autism Alliance of Michigan (AAoM)** offering individuals with autism on-the-job work experience – see case study below.
- Working with the **Blind People’s Association**, Ford of India conducted a site audit of the Sanand plant, gaining insight and recommendations for changes that would make the site more suited to differently abled individuals.
- The **Society of Women Engineers** has teamed up with re-entry firm **iRelaunch** to create opportunities for engineers interested in getting back to their technical careers. Ford will be participating in this program in 2017.

CASE STUDY

FordWorks for Individuals With Autism

In June 2016, Ford and Autism Alliance of Michigan (AAoM) began a collaboration to provide individuals with autism with an opportunity to gain on-the-job experience with the company. The training program is funded by AAoM.

Five new positions in our product development organization were created to suit the skills and capabilities of people with autism, who bring a unique set of talents to our business. As part of this pilot scheme, Ford will evaluate participants for future employment, as well as the program in general. If there is a potential fit, the individual will enter into Ford’s standard recruiting process.

Through FordWorks, individuals with autism gain work experience, and also contribute to business objectives and enhance diversity and inclusion at Ford. The program supports the company’s goal to contribute to a better world and support the communities in which it operates.

“For so many individuals with autism spectrum disorder, getting and keeping a job is a challenge. Often, companies lack understanding of the unique characteristics associated with autism. I applaud Ford for taking these critical steps to understand autism, and for giving those who have struggled to find competitive employment real career opportunities that could be life changing for them.”

Colleen Allen
President and CEO, Autism Alliance of Michigan

> [Watch a video about the program.](#)

HOW WE'RE DOING

2016 Diversity Performance

Of our global salaried workforce:

27% were female



18.8% of managers¹ were female



Of our U.S. employees (hourly and salaried):

30.3% were members of minority groups



23.6% were female



Of our 15 member board of directors:

2 are women



2 identify themselves as members of minority groups



Of our 44 corporate officers:

7 are women



10 identify themselves as members of minority groups



> [More information on our U.S. workforce can be found in the GRI Index](#)

> [Find out more about our diversity and inclusion performance](#)

1. Middle management and above.

Internal Awards and Recognition

Global Diversity and Inclusion Awards

In 2016, we honored 40 teams and individuals from 12 countries through our annual Global Diversity and Inclusion Awards, which recognize those employees who “Go Further.” More than 600 nominations were received from colleagues across the business. The Diversity and Inclusion Awards highlight how utilizing our diverse talents and experiences can help to build a stronger company.

The winners included:

- The **Ford Chinese Association**, an ERG that has helped attract, develop and retain a diverse workforce and partnered across skill teams, countries and regions to facilitate diverse teams that capitalize on business opportunities in the Chinese market.
- The **Global Data, Insight and Analytics Forecast Team**, for creating a data-driven analytical framework to identify key drivers and develop forecasts, and for displaying great resilience in the face of adversity, when power and infrastructure were severely disrupted during flooding in Chennai.
- **Automotive Fuel Cell Cooperation Corporation (AFCC)**, a joint venture with Daimler AG located in Vancouver, Canada, for its transition to a Coaching Culture, in which 25 senior leaders and managers have been trained in the Coaches Training Institute (CTI) “Co-Active” whole-life coaching model.
- The **Asia-Pacific Work Flexibility Team**, for identifying initiatives to apply across the region and providing guidelines for flexible market implementation.

Chairman's Leadership Awards for Diversity

Ford of Europe holds the annual Chairman's Leadership Awards for Diversity (CLAD), which also seek to celebrate the success of our diversity, inclusion and work-life efforts. These awards highlight the achievements of individuals and teams who have contributed to the overall success of Ford of Europe in its aim to build a diverse and inclusive culture that drives business results. 2016 was our most successful year yet, with 136 nominations (covering almost 1,000 people) across nine countries – a 60 percent increase over 2015.

External Recognition

We have received many awards from publications and organizations for our efforts on diversity and inclusion. Those received in 2016/17 include:

- Human Rights Campaign 2016 (U.S.)
- *Equal Opportunity* magazine: 2016 Top 50 Employers (U.S.)
- *Latino Magazine*: Top 100 Employers (U.S.)
- *U.S. Veterans Magazine*: Top Veteran-Friendly Employers (U.S.)
- *Black EOE Journal*: 2016 Best of the Best Top Diversity Employers (U.S.)
- *Top 100 Employers* magazine, *The Globe/Mail* (Canada)
- 2016 Working Mother & AVTAR Best Companies to Work for Women in India (India)
- Taiwan Council of Labor Bureau: Work-Life Balance Award (Taiwan)
- 51 Jobs: Best Employer Award (China)
- ENEI: Community Impact Award 2016 (U.K.)
- Trailblazing Transparency Award – Best Practice Employer (Ford of Europe)
- Universum: World's Most Attractive Employer List – Engineering, Business (Global)
- Universum: Most Attractive Employer List – Engineering (Germany)
- Universum: Most Attractive Employer List – Engineering, Business (Mexico)
- Great Place to Work Institute: 2016 Top 20 Places for Women to Work "Woman Award" (Ford Credit Brazil)

Another Perfect Score in Corporate Equality Index

In December 2016, Ford once again earned 100 percent on the Human Rights Campaign 2017 Corporate Equality Index, a national benchmarking survey related to lesbian, gay, bisexual and transgender (LGBT) equality in the workplace. Ford has received a perfect score every year since 2004. The 2017 Index rated 1,043 businesses on LGBT-related corporate policies and practices such as nondiscrimination protection, domestic partner benefits, transgender-inclusive health care benefits, competency programs and public engagement with the LGBT community.

Supplier Diversity

We are committed to working with and supporting supplier companies owned by minorities, women and veterans, creating business opportunities that enable them to become profitable and sustainable enterprises.

Promoting a Diverse Supply Chain

We recognize that a diverse supply base is an integral part of our overall success, providing fresh perspectives that lead to cutting-edge innovations and accelerated business development. We continue to foster productive relationships with entrepreneurs from a wide range of backgrounds to meet our customers' needs and expectations.

We have long worked with business leaders, trade associations and community organizations representing the interests of diverse businesses, earning Ford a seat at the Billion Dollar Roundtable (BDR), an exclusive group of 22 companies that purchase at least \$1 billion a year from diverse suppliers. The BDR encourages businesses to extend their supplier diversity programs and increase spending levels each year.

Demonstrating our commitment, we are playing a leading role in two major supplier diversity advocacy organizations from January 2016 to December 2017. Joe Hinrichs, Executive Vice President and President, Global Operations (formerly Executive Vice President and President, The Americas), is currently Chairman of the Board for the National Minority Supplier Development Council (NMSDC) while Hau Thai-Tang, Executive Vice President, Product Development and Purchasing (formerly Group Vice President, Global Purchasing), is serving as Chairman of the Michigan Minority Supplier Development Council (MMSDC).

Our Progress

Ford's Supplier Diversity Development (SDD) Program is nationally recognized for its leadership and success in driving innovative best practices; these result in productive business partnerships with diverse entrepreneurs, and valuable products and services for our customers. To date, it has sourced more than \$100 billion in goods and services from minority-, women- and veteran-owned businesses.

In 2016, Ford purchased goods and services worth:

- \$8.8 billion from minority-owned suppliers
- \$2.4 billion from women-owned businesses
- \$1.1 billion from veteran-owned companies

Awards and Recognition

In 2016, our SDD Program received external recognition from a wide range of awards, rankings and rating agencies, suggesting that we continue to perform well against our goal to "maintain leadership in supplier diversity." Several of our people were also recipients of honors and accolades, as detailed below.

Major Recognition for Ford's Supplier Diversity Program

- Michigan Trade Summit – Lifetime International Achievement Award
- Women's Business Enterprise National Council – Corporation of the Year
- Great Lakes Women's Business Council – Corporation of the Year
- Minority Business Development Agency – Distinguished Supplier Diversity Award
- National Minority Supplier Development Council – Corporate Innovation Award
- Michigan Hispanic Chamber of Commerce – Corporation of the Year
- *MBN USA Magazine* – 101 Most Admired Companies in Supplier Diversity
- Hispanic Network – Top Diversity Employers
- *Hispanic Network Magazine* – Top Supplier Diversity Programs

Individual Awards for Ford Employees

- *MBN USA Magazine*:
 - Champion of Supplier Diversity: Hau Thai-Tang, Executive Vice President, Product Development and Purchasing (formerly Group Vice President, Global Purchasing)
 - Champion of Supplier Diversity: Stephanie Williams, Supplier Diversity Development Manager
- 2016 "Best-in-Class" – Chief Procurement Officers: Hau Thai-Tang, Executive Vice President, Product Development and Purchasing (formerly Group Vice President, Global Purchasing)
- 2016 "Best-in-Class" – Executive Champions: Renee Jones, Director, Supplier Diversity Development and Supply Chain Sustainability
- 2016 "Best-in-Class" – Supplier Diversity Professionals: Stephanie Williams, Supplier Diversity Development Manager

- Auto Show Press Week Multicultural Media Luncheon, Lifetime Achievement Award: Hau Thai-Tang, Executive Vice President, Product Development and Purchasing (formerly Group Vice President, Global Purchasing)
- Veteran-Owned Business Roundtable, Leadership Award: Hau Thai-Tang, Group Vice President, Global Purchasing
- WE USA Magazine, Women's Enterprise USA's Top 100 Leaders in Supplier Diversity: Stephanie Williams, Supplier Diversity Development Manager

Employee Attraction and Retention

As well as attracting the right people with the right skills, we seek to engage with them and support them to ensure they stay with the company. We use smart and mobile technology, including social media, to make the hiring process more efficient and more positive for the candidates.

Finding the Right Talent

To help attract a diverse range of qualified job candidates, we partner with professional organizations, and seek to build relationships with top universities to find the best students and recent graduates. In many cases, our executives visit campuses to share information and meet the next generation of potential automotive leaders.

In addition, we attend meetings in the communities in which we live and work to foster relationships with individuals and companies, to build connections and expand collaboration.

But in this age of the internet and social media, our approach to attracting talent increasingly makes use of mobile and online technology to make the process more efficient and effective:



Hackathons

In the U.S., Ford participates in hackathons, both on campus to support college students and via non-campus events such as [Global Hack VI](#). These events, at which programmers, software developers and interface designers collaborate intensively on a particular challenge or task, help us engage with the software community, share the projects we're working on and build awareness of Ford as a technology employer of choice.



Geofilters

With apps like SnapChat, we are using geofilters at our Ford Day events and at professional organization conferences to let more people know we're available to answer their career questions. Through filters on the platforms they already use, we can inform students about on-site events they may not have known about previously.



Online Careers Fairs and Talks

Virtual careers fairs are another great way to reach students and alumni. We use them – from niche fairs for software engineers to broader virtual college career fairs – across the U.S., enabling us to interact with more candidates in a cost-effective way.

Similarly, in China, we use mobile technology to increase our engagement with potential hires, offering online sessions alongside traditional on-campus events. Online Campus Talk, which can be accessed and replayed at any time from any location, includes recorded videos, downloadable materials and a live questions-and-answers function. To date, more than 2,000 students from hundreds of universities have viewed 48,000 hours of information about careers at Ford.

Keeping the Best Onboard

We know that once the right candidates are hired, it is equally important to provide them with a strong and positive onboarding experience that will improve employee retention. For example, our onboarding program in the U.S., Get Started, provides new employees with the tools and networks they need to be productive as soon as possible.

This program includes an overview of the company and the resources available to new recruits, as well as a corporate orientation, including presentations, Q&As with each skill team area and meet-and-greets with Ford's senior leaders. We are now leveraging The Hub, an internal social media platform, to further engage our new employees and build the Get Started community.

Our efforts in attracting, engaging and developing our people is reflected in our excellent retention rates, with our Voluntary Quit Rate below the market benchmark in all major markets in the Americas, Europe and Asia Pacific.

> [See our Voluntary Quit Rate data in detail](#)

Why Ford? Why Stay?

In a recent series of focus groups with employees from all regions, we asked why people were attracted to Ford and why they stayed with the company.

In particular, participants had positive things to say about:

- Ford's history, reputation and brand value
- The career development opportunities available, including the ability to rotate jobs and move locations
- The range of formal and informal training opportunities
- The importance of diversity
- The people, the family culture and Ford's values

Building a Talent Pipeline

To strengthen our pipeline of potential future talent, we have developed a consistent global strategy that focuses on STEAM (science, technology, engineering, arts and math) programs.

Investing in Technology and Innovation

We continue to assess and invest in STEAM programs to inspire an interest in technology and innovation among schoolchildren. Our mission is to develop and deliver innovative, aligned programs for students and educators around the world, prioritizing programs that leverage skills and foster long-lasting partnerships and engagement that nurture technical talent.

As part of our approach, we run "Powered by Ford" STEM Academies to attract high-school students and prepare them for life in the real world. Attendees learn core academic subjects as well as getting involved in engineering, information technology and manufacturing projects, often conducted at our facilities.

In an effort to drive social mobility, we've also awarded millions of dollars in scholarships, providing high-achieving college-bound students with much-needed financial support for their studies. Worth up to \$10,000 each, we awarded 100 Blue Oval STEAM Scholarships in 2016, up from 80 in 2015.

Our Support for STEAM Programs

FIRST® Robotics

With limited resources and tight timelines, groups of students participating in [FIRST® Robotics](#) are challenged to fund, build and program robots to perform certain tasks, competing against other teams.

Ford gives grants for elementary-, middle- and high-school teams, and in 2016, we increased our financial support and mentor engagement. In addition to the 100+ elementary- and middle-school teams, and 87 high-school teams, that participated across the different challenges during 2016–17, about 200 employees volunteered to mentor Ford-sponsored teams.

As part of our commitment to the initiative, we sponsored and supported two FIRST® Robotics District Championships hosted by Kettering University, with two of our STEAM Executive Council leaders, Sue Leone and Brad Simmons, representing Ford as keynote speakers. We also sponsored the FIRST® Robotics Kickoff event at the Michigan Engineering Zone in Detroit.

Ford STEM High School Community Challenge

Ford Next Generation Learning (NGL), a signature program of [Ford Fund](#), has teamed up with the Ford STEAM program to award \$50,000 in grants to creative high-school students who are putting their technical skills to good use.

Building on the success of Ford's College Community Challenge (C3), the Ford STEM High School Community Challenge empowers students to make a positive difference in their communities. Student leadership and participation of community partners are essential aspects of the winning proposals, which sought to address unmet needs in technology, alternative energy, health and other areas.

Six teams from across the United States were selected to implement their inventive solutions. The winners, Whites Creek High School in Nashville, Tennessee, were awarded \$20,000 to convert a Ford F-Series truck and tractor to run on renewable hydrogen fuel. The students will also develop a solar farm to produce electricity and power the new hydrogen processor they plan to build.

The runners-up, Guilford High School in Rockford, Illinois, will use their \$10,000 award to develop solar-powered charging stations with LED lights throughout the city, and create an outdoor learning lab at their school. Four other teams, from Florida, Texas and Georgia, each received \$5,000.

> [Learn more about this year's winning projects](#)

Girls Who Code

To help address the significant under-representation of women in the tech industry, we've paired up with [Girls Who Code](#), an organization working to inspire, educate and equip young women with the skills needed to pursue academic and career opportunities in computing.

At the Ford Research & Innovation Center (RIC) in Palo Alto, California, we've teamed up with the national nonprofit to provide opportunities for young women interested in science, technology, engineering and math (STEM).

Girls Who Code programs across the U.S. combine instruction in robotics, web design and mobile development with access to, and mentorship from, top engineers at RIC. This gives students exposure to real-life role models and hands-on experience on projects at our Silicon Valley research lab.

> [Read more about our partnership with Girls Who Code](#)

Employee Learning and Development

Developing the skills and capabilities of our people is a key part of our strategic priority to build a capable and effective workforce.

Our learning and development vision

is to create a learning organization where everyone has a passion for learning and the capability to continuously improve and transform the organization.

Our learning and development mission

is to enable, encourage and provide high-impact learning experiences that make employees' lives better and drive business growth and transformation.

A Learning Culture

Leadership and Professional Development

To build our capabilities, we continuously invest in developing the professional, technical and leadership skills of our employees. We are establishing a common global framework for how we approach innovation in a customer-centric way, and are incorporating the innovation skills our employees need into our leadership development programs and professional development offerings.

These include a number of programs specifically designed for current and aspiring executives, directors and managers:

- **The Global Leadership Summit:** Aimed at executives and general managers responsible for global projects, departments and budgets, these programs are a combination of immersion in markets and the application of new skills.
- **Global Executive Leadership:** Geared toward directors and senior managers associated with a region, but with responsibilities that extend to the global enterprise.
- **Experienced Leader Program:** Aimed at middle management, the program helps grow the capabilities of our skill team leaders running regional large projects and functional departments.
- **Salaried Supervisor Institute:** A program for new and experienced front-line leaders, which builds foundational leadership skills and hands-on applications.

> [Read a case study from i4cp about how Ford is going "beyond best practice"](#)

Our approach combines virtual web-based learning with classroom training, and spans simulations, project work, mentoring and coaching, social networking, workshops and team lunch-and-learn events. Together, these methods and tools support professional development, foster functional and technical excellence, encourage teamwork and leadership skills, promote One Ford values and drive improved performance.

Leading by Teaching

A key approach for us is Leading by Teaching, where we support our skilled and motivated people to develop themselves and each other. By teaching others, colleagues build self-awareness, gain opportunities for professional development and are exposed to a wide range of opinions; those being taught get exposure to leaders and subject matter experts, and acquire company-specific skills and knowledge in ways that foster engagement and enthusiasm for learning.

> [Read about Ford's new Resource and Engagement Center in South Africa](#)

Supporting Career Development

Personal Development Plans

With operations on six continents, our workforce needs to be locally aware, globally mobile, adaptable and innovative; we also need strong leaders able to operate anywhere in the world. Our accelerated personal development plans and cultural awareness programs help our people succeed in a range of geographical and social contexts.

Ford offers competency frameworks and development plans for salaried employees, to help them determine where they are in their careers, maximize current performance and work toward future goals. Our learning solutions are made available in multiple languages at the MyLearning@Ford portal.

We also run a global Development Discussions for Supervisors course, to ensure that development plan discussions between managers and employees are effective, and that supervisors can guide and support the development of their team members.

In 2016, 52,273 salaried employees (84 percent of those who use our Talent Management System) completed Individual Development Plans online.

Building Emotional Intelligence

In an age when the importance of artificial intelligence (AI) and robots is increasing, people are expected to focus on skills and capabilities that AI has trouble replicating: understanding, motivating and interacting with humans.

In 2016, Ford joined Case Western Reserve University to participate in a unique study, which found that listening to, understanding and inspiring colleagues can account for as much as 31 percent of engineers' effectiveness. Ford engineers – and their colleagues – were asked whether they love their workplace, and how they cooperate and discuss ideas. The study also found it was possible to predict how enthusiastic engineers would be about projects, just by knowing how those projects were communicated.

We also opened the Merkenich Innovation Hub in Germany, giving the 25,000 engineers who work across our global network of 10 engineering and research centers on-demand access to dedicated workshops, training and ideation sessions, research findings, and patent consultation. We plan to launch similar hubs around the world.

Better Connections Through Mindfulness

Ford of Canada has offered mindfulness training to employees at its headquarters for several years, continuing in 2017. Based on neuroscience research, mindfulness builds the core emotional intelligence skills needed for peak performance and effective leadership, fostering an organizational culture where employees are more present and connected with themselves and each other.

Ford in the Community

Ford Motor Company is more than just an employer; we're also a neighbor, and our business is only as strong as the local communities in which our employees and customers live and work. It is therefore in our mutual interest to work with them, and invest in them, to improve quality of life for all.

Investment and Engagement

Our support for the communities in which we operate goes beyond just donating money to good causes. It's also about building long-lasting partnerships to address the challenges our neighbors face,

helping provide food and shelter, improving educational opportunities, and contributing to emergency relief and disaster response.

Ford's community involvement comes through direct investment and positive engagement, and by applying our expertise and technology to help address societal challenges. Our increasingly integrated approach aligns our community relations programs, our community impact assessments, and our [key sustainability and business priorities](#). This ranges from respecting [human rights](#), a fundamental aspect of our license to operate and vital for maintaining the trust of local communities, through to addressing [Δ](#) beyond our own operations.

Assessing Our Impact

As our business grows, so does our community investment and volunteering efforts.

In 2016, our charitable contributions¹ totaled \$58.9 million.

Current and retired employees donated 204,000 volunteering hours in support of good causes through the [Ford Volunteer Corps](#).

Our [dealer network](#) also makes significant community investments.

We continue working to improve our ability to measure the impact of our efforts, beyond charitable contributions and volunteering hours, in a more holistic manner.

[> See our charitable contributions data in more detail](#)

Ford Credit's Community Investments

Ford Motor Credit Company ("Ford Credit"), a wholly owned subsidiary of Ford Motor Company, offers automotive financial services to dealerships and customers around the world. Ford Credit's long-standing commitment to its local communities ranges from employee volunteering opportunities to structured work experience programs for young people.

1. Contributions from Ford Fund, and Ford Motor Company contributions administered through Ford Fund.

Community Projects

Our volunteering efforts and philanthropic investments are overseen and coordinated by Ford Motor Company Fund and Community Services (Ford Fund). Ford Fund supports initiatives and nonprofit organizations in three key areas: community life, education and driver safety.

THE ROLE OF FORD FUND

Coordinating Our Community Efforts

Helping strengthen the communities in which we operate and understanding their needs have been priorities for us since Henry Ford started the company more than 100 years ago.

Funded by contributions from Ford, we seek to build partnerships and support programs that meet local community needs, align with our business plan, have a measurable impact and, where possible, are replicable in other markets. We prioritize the support and development of organizations that promote diversity and inclusion.

Ford Fund evaluates grants on an annual basis, and grassroots engagement is driven by local teams in each region. To date, Ford Fund has invested more than \$1.5 billion in civic organizations to strengthen communities around the world.

Ford Fund – 2016 Contributions¹

	\$ million
Community Life	32.8
Education	18.4
Driver Safety	7.7
Total	58.9

Data notes and analysis:

1. Contributions from Ford Fund, and Ford Motor Company contributions administered through Ford Fund.

Community Life

Building Sustainable Communities

We are committed to creating a better world by making people's lives better in communities around the globe. Our efforts focus on hunger relief, poverty alleviation, and supporting the elderly, disabled, military veterans and other under-represented populations. They also include environmental initiatives, with a particular focus on access to water, hygiene and sanitation.

Our support for more than 700 community groups during 2016 included:

- Detroit's **tiny homes** project, an innovative neighborhood revitalization scheme that provides affordable housing for low-income residents and formerly homeless people
- **Ford Mobile Food Pantries**, a fleet of 60 Ford Transit Connect vans helping food banks deliver more meals
- Transporting more than 673,000 U.S. military veterans to medical appointments in the 207 vehicles we have donated to **DAV Transportation Network** over the past 20 years
- Support for **refugee integration** in Germany (see below).

CASE STUDY

Refugee Integration Program, Germany

The refugee integration program is a cornerstone of Ford's community engagement in Germany. There is an active network of over 300 employees supporting refugees in more than 20 community projects. Approximately 2,500 Ford working hours and private time have been invested. Grants to support local community needs and assist refugees in 2016 include \$70,000 from Ford Fund.

Partnering with the city of Cologne and nongovernmental organizations, Ford is supporting a range of community projects, including meeting the needs of unattended minors and refugee teenagers with accommodation, mentoring, coaching and activities. Another key focus is supporting refugees of working age with training and work opportunities.

Training and Work Opportunities for Refugees

Our 11-month, full-time "entrance qualification" (EQ) program aims to help refugees enter employment and equip them with the skills, work environment knowledge and language competency to do so.

Ford has offered the EQ program for more than 40 years, which leads to the possibility of an apprenticeship in our plants or with other companies. First developed to provide opportunities to new immigrants to Germany, in 2016, we expanded the program to all refugees who come to the country.

The program now enables a further 24 candidates (up to the age of 35, and with the necessary language proficiency and school education) to take part. Within the program, we offer German classes to help participants develop their linguistic confidence and ability.

Eighty percent of candidates who complete the program go on to start an apprenticeship with Ford as the first step in a future career.

Disaster Relief

Ford has a long history of assisting communities devastated by natural disasters around the world. Our support includes grants to nationally recognized aid organizations as well as employee-matching programs and employee volunteerism.

Ford Fund donated \$1 million in disaster relief aid last year, including:

- Supporting emergency efforts in the Caribbean following Hurricane Matthew
- Providing earthquake recovery assistance in Italy
- Tornado and flood relief in the American South and Midwest
- Aid to areas impacted by wildfires in Alberta, Canada, and Tennessee in the United States

As well as grants that help people recover from natural disasters, Ford Fund continues to innovate and expand the reach of our helping hands. In 2016, we introduced the **Ford Motor Company Disaster Relief Mobility Challenge**, a new U.S.-based initiative that challenges nonprofits to find creative ways to help people in their communities. The Challenge provides grants toward the purchase of a custom-outfitted Ford Transit or truck to serve in missions that rebuild damaged communities.

Ford Fund awarded grants to three U.S.-based nonprofits actively engaged in disaster relief work:

- Toolbank will stock a Transit with free-to-use tools for devastated communities
- Team Rubicon will transport veterans as disaster response volunteers
- Catholic Charities USA will use a Ford F-450 box truck to tow washers and dryers to communities in need

[› Read more about the Ford Volunteer Corps](#)

Over the last 10 years, Ford and Ford Fund have made **community investments totaling \$161 million** in Detroit and southeast Michigan.

Centralizing Community and Cultural Services

The idea behind Ford's Resource and Engagement Centers is to provide an innovative model for neighborhood involvement, using a flexible approach that centralizes community services, and drawing on expertise and support from nonprofit partners and Ford volunteers. Since opening our first center in southwest Detroit in 2013, more than 80,000 local residents have been assisted through social and cultural services, ranging from providing 1.5 million pounds of food to helping more than 6,000 people complete their tax returns. The center returns \$3 to the community for every \$1 invested. Given this success, Ford Fund – in cooperation with Detroit Public Schools Foundation and Detroit Public Schools – is opening a second center in the city. This will bring \$5 million in services to thousands of students and residents on the city's east side.

In May 2016, we announced the creation of a new Resource and Engagement Center in South Africa, located on the grounds of our Silverton plant outside Pretoria (see below).

CASE STUDY

Ford Resource and Engagement Center, South Africa

Ford's new Resource and Engagement Center in South Africa is part of a five-year, \$4 million investment across the African continent to support the company's growth and its commitment to making people's lives better. The center will provide training and help approximately 200 people in South Africa to find a job or start their own small business – through skills development, training programs, grants and educational scholarships. In collaboration with nonprofit Future Families, the center will also offer services for families and orphans affected by HIV and AIDS.

This marks the first international expansion of the highly successful project Ford Fund launched in Detroit, to bring nonprofit community services together in a collaborative environment. Ford will invest more than R2 million annually in job training through the new center in South Africa.

“Ford Fund has a proud tradition of strengthening the communities that are home to our employees, dealers, suppliers and customers. As our company expands throughout the African continent, we are bringing our innovative community investment programs to new regions to create a better world.”

Jim Vella

President, Ford Motor Company Fund and Community Services

> [Read about other social investment projects in our Middle East & Africa region](#)

Education

Education is the engine that drives individual and community prosperity, and we invest in innovative, sustainable education programs that connect students with classroom learning and real-world applications. Ford Fund supports programs that empower young people to take control of their future, help make people's lives better in their communities and drive social mobility upward for all.

In 2016, Ford Fund invested more than **\$18 million** in education initiatives, assisting **323,000 people** in **22 countries**.

Ford Fund supports a number of signature education initiatives:

Ford Next Generation Learning (NGL)

Our nationally recognized program transforms high schools with career-themed academies focused on engineering, manufacturing, design and health care. Active in 36 U.S. communities, Ford NGL has connected more than 200,000 students with professionals working in their chosen field, giving them an opportunity to gain real-world experience and learn by doing.

Ford College Community Challenge (C3)

In this global initiative, teams of college students in nine countries propose innovative projects, based on the theme of building a sustainable community, that address a pressing local need. Winning teams receive funding from Ford Fund to implement their projects. The “challenge” concept has resulted in additional branches, including **Historically Black Colleges and Universities Community Challenge** and **Ford STEM Community Challenge**.

Ford Driving Dreams Tour

Ford Driving Dreams empowers students to achieve academic success through scholarships, book donations, leadership programs, college preparedness tools, motivational pep rallies, essay contests and career-building activities. To date, its initiatives have delivered more than \$3 million in educational resources and over \$1.3 million in grants since the program's launch in 2010. Having reached more than 100,000 students in California, Florida, Illinois, Indiana and Texas, the program has now expanded to support students in Panama and [Puerto Rico](#).

Ford Blue Oval Scholarships

In an effort to drive social mobility, Ford has awarded millions of dollars in scholarships, providing high-achieving students with much-needed financial support for their college studies.

> [Read more about how we invest in technology and innovation](#)

Powered by Ford STEAM Academies

Focused on science, technology, engineering, arts and math (STEAM), the academies help prepare students for the high-tech jobs of the future.

Ford STEAM Lab

Our online curriculum empowers schools to foster creativity and innovation by incorporating “design thinking.” These culminate in “hackathons,” where students develop apps that address local issues and needs.

> [Read more about our STEAM activities](#)

Driver Safety

The industry-leading centerpiece of our commitment, [Ford Driving Skills for Life](#), is a free, interactive program focused on addressing inexperience, distractions and impaired driving. The award-winning initiative uses state-of-the-art equipment to teach new drivers essential skills in four key areas: vehicle handling, speed management and space management, hazard recognition and distracted driving.

> [Read more about safer driving](#)

GLOBAL OUTREACH

Operation Better World

Ford Fund's Operation Better World is a coordinated, grassroots initiative designed to develop transformational programs focused on mobility, education and sustainable communities. Ford Fund awarded 190 grants worth \$9.25 million in 2016.

In collaboration with the nonprofit Global Giving Foundation, innovative programs in 49 markets utilize the expertise of local Ford teams and community leaders to make a world of difference:



China

The Level Up! initiative builds the organizational capacity of grassroots environmental groups in China through project mentoring, workshops for environmental leaders and entrepreneurs, capacity-building training and development, and support networks.



Germany

Ford Fund supports education workshops at the Children's University in Cologne, where more than 4,000 young people participated in primarily STEM-related learning.



India

Our Happy Schools program helps bridge gaps in education by improving infrastructure in classrooms, playgrounds and sanitation facilities, and incorporating “learning by doing” in school curricula. Through entrepreneurial workshops in tailoring, provided in partnership with nonprofit Hand in Hand, women are empowered to start their own micro-enterprises.



Morocco

The Henry Ford Entrepreneurship Academy runs workshops for future business leaders, providing the skills and tools they need to launch and grow new ventures. The program has been extended to Effat University, a university for women in Saudi Arabia.



South Africa

We're expanding our Blue Village initiative, named by local residents after the shipping containers now being converted into new homes.



Venezuela

Leading Your Future is an award-winning community-based automotive training program for disadvantaged youth (see below).



West Africa

Ford has worked with Riders for Health, an international nonprofit organization, whose vehicles bring medical professionals and supplies to remote areas in The Gambia and Nigeria.

CASE STUDY

Training Disadvantaged Youth in Venezuela

Each year, the Leading Your Future program provides four months of comprehensive automotive technical training to 60 unemployed, educationally disadvantaged young Venezuelans aged between 19 and 25. The program is endorsed by the prestigious University of Carobabo and is supported by an active volunteer group of 70 Ford employees. Sixteen of the Ford employees have been certified by the university as trainers, and the lessons provided by the Ford team have become part of the curriculum endorsed by the university.

Over the two years since the program began, 56 at-risk youth participants received an Automotive Training Diploma endorsed by the university and 32 new participants are currently enrolled in the program.

The Ford Venezuela team has received the company's Diversity and Inclusion Award in recognition of employees' vital role in the Leading Your Future program.

Employee Volunteering

Volunteerism is an integral part of our business. We encourage our employees to participate in programs that strengthen the communities in which we operate.

The Role of the Ford Volunteer Corps

Leading the way in our mission to create a better world, the Ford Volunteer Corps was launched by Bill Ford in 2005 in the aftermath of the devastating Indian Ocean tsunami and deadly hurricanes in the United States. It has since grown into a highly coordinated network of current and retired Ford employees across six continents, helping feed the hungry, deliver clean water, build homes, renovate schools and mentor young people.

To maximize the two paid workdays we offer salaried employees each year to volunteer in the community, our "matchmaking" software system enables nonprofit partners to inform us when and where they need help, while employees can sign up online for opportunities based on their interests, skills and availability. We are continuing to enhance the user experience and strengthen our data collection, especially outside the United States.

Since it was launched in 2005, Ford Volunteer Corps members have contributed nearly 1.5 million hours of community service in 48 countries, representing more than \$34 million of in-kind community investments.

> [Find out more about our community projects](#)



Our Volunteering Programs

Ford Global Caring Month

To mark its 10th anniversary in 2015, we extended our flagship Ford Global Week of Caring to become our very first Ford Global Caring Month. This was repeated in September 2016, with more than 24,000 current and retired employee volunteers participating in 1,544 projects around the world. These included:

-  **Angola**
Paint, repair and renovate a secondary school.
-  **Australia**
Improve the grounds surrounding a family retreat run by the Salvation Army.
-  **Brazil**
Renovate a nursery, daycare and library for children.
-  **Colombia**
Overhaul a food bank's delivery area and sort donations.
-  **Germany**
Develop urban gardens and help with construction work at a high school.
-  **India**
Make renovations at a home for senior citizens.
-  **Mexico**
Build water storage facilities, feed the hungry and make improvements at an orphanage.
-  **South Africa**
Renovate bathrooms, repair ceilings and doors, and paint homes for children.
-  **United Kingdom**
Modernize and make improvements at a mental health facility.

Ford Accelerated Action Days

Ford employees from across the United States filled nearly 11,000 volunteer opportunities in more than 1,100 community projects during 2016. Some of those volunteer activities took place on what we call Ford Accelerated Action Days (AADs). There are four AADs each year that concentrate on critical work identified by our nonprofit partners. These one-day volunteering sessions often involve larger groups of Ford volunteers and are focused on children and families, the environment, community building and feeding the hungry. Four more AADs are planned for 2017.

Bill Ford Better World Challenge

Established in September 2015, the Bill Ford Better World Challenge is a global grant program, jointly funded by the company and Executive Chairman Bill Ford. The initiative enables employee volunteers to apply for grants, totaling up to \$500,000 a year, for transformational community service projects that address issues in the areas of mobility; basic needs such as food and shelter; or access to water, sanitation and hygiene.

Since the challenge was issued, employees have answered the call, submitting ideas designed to make a difference in the world. In 2016, funding was awarded to two projects – a community water project in Thailand (see below) and GoodTurn, a mobile app for non nonprofits that reflects Ford's wider approach to mobility, beyond the car.

Clean Water Community Project, Thailand

Thanks to hundreds of Ford volunteers and a \$200,000 grant from the Bill Ford Better World Challenge, a project in Thailand will support 13 schools in Chanthaburi province, bringing a better life to 3,300 people.

Within a year, Ford volunteers have joined local communities to improve access to clean water through purification systems, wash basins and restrooms at nine rural schools.

Volunteers also planted hundreds of banana trees, and built an oyster mushroom farmhouse, chicken coop and other facilities at one school to grow vegetables. As well as being served at school lunches, the crops are sold to fund further agricultural initiatives at the school.

> [Watch a video on the project.](#)

Thirty Under 30

Thirty Under 30, also launched in 2015, saw 30 employees under the age of 30 trained on civic engagement and leadership skills, with a focus on philanthropy and volunteerism. The nine-month program, trialed as a U.S. pilot, paired three cross-functional teams with local nonprofits: the Salvation Army, Detroit Rescue Mission Ministries and the United Way for Southeastern Michigan.

As well as using fresh thinking to address the challenges faced by the organizations, the millennial employees were taught how to apply solutions-based “design thinking” to life, business and cultural situations. The millennials also offered insights designed to help the nonprofits connect with and appeal to the next generation of young philanthropists.

2016 saw the inaugural class “graduate,” and complete their training by presenting their solutions to Executive Chairman Bill Ford and other company leaders. Now, they're ready to work as philanthropists, to get involved and to build stronger communities.

More than 200 employees applied to join the inaugural program, but the number of applicants to the new class of Thirty Under 30, which kicked off in February 2017, increased significantly to 362. The number of participating nonprofits has also risen to six, and the focus this year is on solutions that address food insecurity.

> [Watch the final Thirty Under 30 showcase](#)

> [See what the opportunity meant to the class of 2016](#)

> [See the detailed data behind our volunteering efforts](#)

Dealers

Our dealers are a vital part of our success. They represent the public face of Ford and provide employment, tax support, leadership and customer service in our communities.

Our Dealer Network

To improve facilities and create loyal advocates of our products and services, we collaborate with our U.S. Ford dealers through the Ford Trustmark Facility Assistance Program. We also work closely with our Lincoln dealers to improve the retail experience for the luxury car customer.

We continue to help dealers connect with their communities, through educational resources and training, and by providing capital loans to minority dealers. We also work with our Ford Minority Dealers Association (Ford MDA) and the National Association of Minority Automobile Dealers to sustain and strengthen their viability, and to gain new partners.

At the end of 2016, we had 11,737 Ford and Lincoln dealerships.

Dialogue with Dealerships

Our Ford and Lincoln Dealer Councils play a vital role in facilitating open dialogue. Through these forums, dealers can share their concerns and opinions openly and productively. Details are published annually, along with Ford management input, for added transparency.

Dealer Council members also participate in Ford's National Dealer Advisory Panels, addressing a range of issues, including customer experience and satisfaction, new product development plans, dealer training, marketing and advertising.

Beyond everyday interactions, dealer satisfaction is measured through the [National Automobile Dealers Association \(NADA\)](#) biannual survey.

> [Access performance data about dealer attitude](#)

A Tradition of Giving

According to our annual survey on Dealer Giving, U.S. Ford and Lincoln dealers gave around \$114 million and over 800,000 hours of volunteering to local causes and nonprofits in 2016. Nearly 80 percent said their teams give both time and money to local causes.

In 2016, the main areas they supported were:

- Children's charities (69 percent)
- Education and scholarships (62 percent)
- Veterans' causes (56 percent)
- Police, fire and other first responders (46 percent)

Our Salute to Dealers

We recognize the hard work and dedication of the thousands of Ford and Lincoln dealers through our annual Salute to Dealers program. The scheme demonstrates our commitment to those who go above and beyond to give back to the communities in which they live and work.

We're very proud of the contributions made by those nominated and selected as honorees since the program was launched in 2001. In 2016, our 17th annual awards recognized the generosity and community spirit of the following dealer principals, each of whom receive a \$10,000 donation to the charity of their choice. The six winners were selected from a global field of nearly 80 nominees.

> [Watch a video about our Salute to Dealers](#)

Ken Crowley, Crowley Ford Lincoln, Plainville, Conn., United States

Ken Crowley's annual JDRF Golf Tournament has raised more than \$1 million in the fight against Type 1 diabetes, and he is actively involved in Operation Embracing Lonely Families (ELF), hosting an annual Christmas party and supporting the families of deployed troops with food, toys and money. Crowley Ford Lincoln was also one of the first U.S. dealerships to participate in the U.S. Army Reserve's Employer Partnership Initiative, which trains and hires veterans in civilian careers after their discharge from active duty. Dealership personnel serve as event ambassadors in the Drive 4 UR School and the Lincoln Driven to Give programs, guiding other dealerships on how to help schools and charities host fundraising events.

1. Contributions from Ford Fund, and Ford Motor Company contributions administered through Ford Fund.

Natalie Tindol, Tindol Ford, Gastonia, N.C., United States

Natalie uses her dealership to strengthen lives in the community, raising money for the local Boy Scouts, the Gastonia Police Foundation and schools across the county through the Education Foundation. She is passionate about her role with the local Girl Scouts, working as a troop leader for 13 years to develop leadership qualities and self-confidence. As a former president of the Community Foundation of Gaston County, Tindol has also helped coordinate an annual event where more than 100 nonprofits raise money for their charitable organizations, generating more than \$12 million over the past 12 years.

Alan Jay Wildstein, Alan Jay Ford Lincoln, Inc., Sebring, Fla., United States

In addition to donating to hundreds of charities, events, organizations and individuals, Alan Jay Wildstein encourages philanthropy among his 400 team members, who actively give their time, money and efforts throughout the community. The Alan Jay Wheels for A's program gives one graduating senior at each of five local high schools a late-model vehicle as they start the next chapter of their lives. Seniors earn entries into the draw with each "A" they receive during their senior academic year, and nearly 70 vehicles have been given away to date. In addition, Wildstein has sponsored 16 Habitat for Humanity homes and, for each holiday season for more than 20 years, Wildstein "adopts" a local elementary school. Wildstein and his team dress as Santa and elves, distributing toys to the children.

Vaughn A. Wyant, Jubilee Ford Sales Ltd., Saskatoon, Saskatchewan, Canada

Vaughn Wyant led a team of fellow dealers and local businesses to create and auction a custom-designed Ford F-100 truck, raising \$450,000 for the Children's Hospital Foundation of Saskatchewan. For more than 25 years, Wyant's company has been the lead sponsor of the Black Tie Bingo for Saskatoon City Hospital Foundation, raising over \$2 million for critical services and equipment. Wyant also donated \$1 million toward the construction of a new, world-class art gallery, and made a \$500,000 donation to the University of Saskatchewan toward the construction of a new sports and recreation facility for community use.

Paul Brown, John Andrew Ford, Auckland, New Zealand

Paul Brown is a dedicated advocate and supporter of Camp Quality, a charitable initiative that focuses on improving the quality of life for children living with cancer through summer camps and year-round activities. Proceeds from his dealership's many fundraising efforts to date exceed \$950,000. Furthermore, Brown is a generous supporter of the BDO Wellington to Auckland Cycle Challenge, a seven-day, cross-country event that raises money for charitable causes. Each year, his dealership donates vehicles to the winners of the corporate challenge race, which in turn assign the vehicles for use by selected charities, including the Cancer Society and Ronald McDonald House. Brown has also completed two terms on local school boards, spearheading fundraising efforts and donating his personal time to important educational projects.

Turgay Mersin, Sadıkoğlu, Uşak, Turkey

Turgay Mersin has donated funds to help build several schools, and initiated a business club with a local university that pairs students with industry and business. Mersin supports the Association of Disabled Persons and a local nonprofit organization that raises cancer awareness through the Today One Hour and Tomorrow One Life campaign. He has built a new mosque for the community, and raises awareness and social sensitivity regarding violence against women. His environmental contributions include the creation of a "Memorial Wood," planting more than 3,000 trees, and the creation of a new well to provide much-needed water in Tanzania.

PERFORMANCE AND DATA

IN THIS SECTION

- [Goals and Progress](#)
- [Key Performance Data](#)

Our reporting includes an overview of the progress we have made against our goals and commitments, a summary of our performance in key areas, and a range of tables and charts providing more detailed performance data.

Our Goals and Progress

We have summarized our progress against our goals, commitments and targets in relation to our material issues and other important performance areas.

> [Read more about our goals and progress](#)

Key Performance Data

We provide comparative performance data over three years in areas of most importance to our business.

> [See our key performance data in more detail](#)

Data Tables

For fuller data reporting, including detail on trends and accompanying notes, please access the separate Data Tables pdf on the Downloads page.

Goals and Progress

This table summarizes Ford’s goals, commitments, targets and progress in our material issue areas and other important performance areas.

GLOBAL MOBILITY		
Goal	2016 Progress Examples	Status
Deliver our Ford Smart Mobility plan, with a focus on emerging opportunities in mobility.	<p>We revealed our vision for the City of Tomorrow and created the City Solutions team to help solve congestion issues and help people move more easily.</p> <p>We announced an agreement to acquire Chariot, a crowdsourced shuttle service, to drive the growth of Ford’s dynamic shuttle service globally.</p> <p>Through FordPass, we continued to focus on enhancing the consumer experience and added functionality to the FordPass app and services over the year.</p> <p>In our markets across the world, we partnered with stakeholders to develop mobility solutions and encouraged innovative tech through a further series of our Innovate Mobility Challenge.</p>	In process
CUSTOMERS AND PRODUCTS		
Goal	2016 Progress Examples	Status
<p>Improve fuel economy across our global product lineup, consistent with regulatory requirements and addressing climate stabilization.</p> <p>Offer competitive or “among the leaders” fuel economy for each new or significantly refreshed vehicle.</p>	<p>Our combined car and truck fuel economy declined slightly in 2016, but the fuel economy of cars alone (both domestic and imported) improved.</p> <p>We’ve brought our fuel-saving EcoBoost® engine to more than 8 million engines worldwide.</p> <p>> Improving Fuel Economy</p>	In process
Pursue our electrification strategy.	<p>Our \$4.5 billion investment in electrification will see 13 new electric vehicles by 2020, by which time more than 40 percent of our lineup will be electrified.</p> <p>> Alternative Fuels and Powertrains</p>	On track

CUSTOMERS AND PRODUCTS

Goal	2016 Progress Examples	Status
Continue our lightweighting plans.	<p>We are adopting advanced lightweight materials to help reduce fuel economy wherever practicable.</p> <p>Our F-Series trucks feature advanced aluminum alloy bodies, allowing us to save weight and deliver even more capability.</p> <p>We have helped develop a prototype carbon fiber composite subframe that reduces mass by 34 percent compared to stamped steel.</p> <p>> Improving Fuel Economy</p>	On track
Offer alternative fuel vehicles.	<p>We offer engine packages on a wide range of commercial vehicles specially prepared for conversion to compressed natural gas and liquefied natural gas.</p> <p>We continue to support the development of next-generation biofuels and to partner on hydrogen fuel cell research.</p> <p>> Alternative Fuels and Powertrains</p>	On track
Continue to develop and implement our sustainable materials strategy – focused on materials that have been obtained by socially sustainable means, that have lower environmental impacts and that provide equivalent or superior performance to existing materials.	<p>We are increasingly using materials that are more sustainable from a total life cycle perspective, including recycled, renewable and recyclable materials, and working to decrease or eliminate undesirable materials.</p> <p>We have eliminated or reduced substances of concern well ahead of regulatory requirements through our Restricted Substance Management Standard.</p> <p>> Using Sustainable Materials</p>	On track
Design and manufacture vehicles with safety excellence focused on real-world safety and offer innovative safety and driver assist technologies. Meet or exceed all regulatory requirements for safety.	<p>Continued to implement:</p> <ul style="list-style-type: none"> – Our Quality Operating System to deliver high-quality, safe and secure vehicles – Our stringent internal engineering design guidelines, which exceed regulatory requirements <p>> Improving Vehicle Safety</p>	On track
Provide information and educational programs to assist in promoting safe driving practices.	<p>Ford Driving Skills for Life (Ford DSFL), our free driver education program, reached more than 1 million young people and newly licensed drivers in 35 countries by the close of 2016.</p> <p>> Encouraging Safer Driving</p>	On track
Play a co-leadership role in vehicle safety and driver assist research and innovation.	<p>Continued to collaborate with:</p> <ul style="list-style-type: none"> – Other automotive companies on precompetitive safety projects – University partners on a wide range of research projects, including research into advanced safety technologies <p>> Driver Assist Technologies</p>	On track

OPERATIONS

Goal	2016 Progress Examples	Status
Reduce global facility CO ₂ emissions per vehicle produced by 30 percent between 2010 and 2025.	<p>Achieved 29.6 percent reduction by 2016.</p> <p>> Energy Use and Greenhouse Gas Emissions</p>	In process
Reduce global facility energy use per vehicle produced by 25 percent between 2011 and 2016.	<p>Achieved greater than 25 percent reduction by 2016.</p> <p>> Energy Use and Greenhouse Gas Emissions</p>	Achieved
Having achieved our previous goal two years ahead of schedule, we have set a new, aggressive target: to save an additional 30 percent of water from our manufacturing between 2015 and 2020.	<p>Achieved 4 percent reduction by 2016.</p> <p>> Water Use</p>	In process
Reduce global waste sent to landfill by 40 percent per vehicle produced between 2011 and 2016.	<p>Achieved 65 percent reduction by 2016.</p> <p>> Waste Reduction</p>	Achieved

HUMAN RIGHTS / SUPPLY CHAIN

Goal	2016 Progress Examples	Status
Ensure everything we make – or that others make for us – is consistent with local law and our own commitment to protecting human rights, as embodied in our Policy Letter 24, our Code of Human Rights, Basic Working Conditions and Corporate Responsibility.	To determine priority locations for our human rights efforts, we conduct an annual risk analysis. As a result, our list of 22 high-priority countries remained unchanged in 2016. We also reviewed our internal policies and procedures to ensure they aligned with the fundamental tenets of ethical recruiting. At the end of 2016, 100 percent of our production Aligned Business Framework (ABF) suppliers had codes of conduct aligned with our Policy Letter 24, and 82 percent had robust systems governing their own operations and those of their supply chain. › Human Rights and Working Conditions › Environmental Impact of Our Suppliers	On track
Help suppliers build their capacity to manage supply chain sustainability issues.	In 2016, representatives from 161 direct and indirect supplier sites in five countries attended in-country training sessions covering human rights, working conditions, business ethics and the environment. › Environmental Impact of Our Suppliers	On track
Assess Tier 1 suppliers for compliance with local laws and Ford’s supply chain sustainability expectations.	Thirty-five initial social responsibility audits (including 31 using the new EICC methodology) and 154 follow-up audits were conducted in 2016. › Auditing Our Suppliers	On track
Engage with our supply chain to understand its carbon and water footprints.	Surveyed 242 production suppliers, as well as indirect suppliers of logistics and information technology services, using the CDP Supply Chain program’s questionnaires; 196 suppliers were also invited to respond to the CDP Water questionnaire, and 140 (71 percent) responded. › Environmental Impact of Our Suppliers	In process
Work with selected suppliers to reduce our collective environmental footprint by encouraging target setting and sharing best practices for energy and water use reductions.	Extended over the past two years, our supply chain sustainability initiative Partnership for A Cleaner Environment (PACE) now includes more than 40 strategic suppliers with the potential to impact nearly 1,100 supplier sites in more than 40 countries. › Environmental Impact of Our Suppliers	In process
Improve the transparency of mineral sourcing within our supply chain while improving the capacity of conflict-free smelters.	For a second consecutive year, 100 percent of our in-scope suppliers submitted an annual conflict minerals reporting template. › Conflict Minerals	Achieved
Continue effort to source purchases from veteran-, minority- and women-owned businesses.	Ford purchased goods and services worth \$8.8 billion from minority-owned suppliers; \$2.4 billion from women-owned businesses; and \$1.1 billion from veteran-owned companies. › Supplier Diversity	Achieved

HEALTH AND SAFETY

Goal	2016 Progress Examples	Status
Fatalities target is always zero.	Regrettably, in 2016, there were two fatalities among Ford employees – the first for seven years. One occurred in Europe and the other (a non-work-related act of violence) in North America. There was also one fatality among contractors working at our facilities. The circumstances were analyzed in detail and actions were taken to prevent future incidents of a similar nature. › Health and Safety	Not achieved
Serious injuries target is zero; overall goal is to attain industry competitive lost-time and drive continuous improvement; specific targets are set annually by business units.	The lost-time case rate stands at 0.39 cases with one or more days away from work per 200,000 hours, compared to 0.43 in 2015. › Health and Safety	On track
Maintain or improve employee personal health status through participation in health risk appraisal and health-promotion programs.	We continued to provide programs and services that empower employees to achieve health and well-being. Offerings were tailored to meet individual and local priorities, and resources provided to help individuals make informed choices. › Health and Safety	On track

Key Performance Data

Below is a summary of key performance data for 2016. Please see our [Data Tables](#) for more detail and trends. For further information on data boundaries and assurance, please see [About This Report](#).

FINANCIAL HEALTH			
	2014	2015	2016
Pre-tax profits (excluding special items), \$ billion	7.3	10.8	10.4 ¹
CUSTOMERS AND PRODUCTS			
	2014	2015	2016
Ford U.S. corporate average fuel economy, combined car and truck, miles per gallon (higher mpg reflects improvement)	30.1	30	29.8 ²
Ford U.S. CO ₂ tailpipe emissions per vehicle, combined car and truck, grams per mile (lower grams per mile reflects improvement)	297	296	308 ³
Ford Europe CO ₂ tailpipe emissions per passenger vehicle, grams per kilometer (100% of vehicles) ⁴	121.449	118.133	120.034
Global Quality Research System "things gone wrong" (3 months in service), total "things gone wrong" per 1,000 vehicles ⁵			
North America	1,392	1,265	1,273
South America	1,472	1,207	1,119
Europe	1,302	1,232	1,379
Middle East & Africa	1,046	775	510
Asia Pacific	917	846	788
Global Quality Research System customer satisfaction (3 months in service), percent highly satisfied ⁵			
North America	79	81	81
South America	68	70	68
Europe	73	75	73
Middle East & Africa	62	67	70
Asia Pacific	69	71	68
U.S. safety recalls, number per calendar year (including legacy vehicles on the road for 10+ years)	40	40	33
U.S. safety recalls, million units (including legacy vehicles on the road for 10+ years)	4.74 ⁶	4.99	5.97
	2015	2016	2017
Percent of nameplates achieving five-star New Car Assessment Program (NCAP) Overall Vehicle Score (percent of Ford Motor Company vehicles tested by model year) ⁷	65	62	71
OPERATIONS			
	2014	2015	2016
Worldwide facility energy consumption, billion kilowatt hours	14.94 ⁸	14.6	14.2
Worldwide facility energy consumption per vehicle, kilowatt hours per vehicle	2,470	2,244	2,133
Worldwide facility CO ₂ emissions, million metric tons	4.6	4.7	4.6
Worldwide facility CO ₂ emissions per vehicle, metric tons	0.76	0.72 ⁹	0.69
Global water use, million cubic meters	24.1	24.9	24.7
Global water use per vehicle produced, cubic meters	3.99	3.90 ¹⁰	3.70

STRATEGY AND
GOVERNANCECUSTOMERS AND
PRODUCTS

OPERATIONS

PEOPLE AND
COMMUNITIESPERFORMANCE
AND DATA

SUPPLY CHAIN

	2014	2015	2016
Total supplier sites trained/retrained in sustainability management (cumulative, since 2005)	2,948	3,156	3,302
Assessments to date	990	1,071	1,106
Training cascade to workforce, individuals trained	559,755	630,218	705,216

COMMUNITIES

	2014	2015	2016
Ford Motor Company Fund charitable contributions, \$ million	30.2	37.2	38.9
Corporate charitable contributions, \$ million	15.4	18.4	20.0
Volunteer Corps, thousand volunteer hours	160	186	204

OUR PEOPLE

	2014	2015	2016
Lost-time case rate by region (per 100 employees; cases with one or more days away from work per 200,000 hours)			
North America	0.75	0.75	0.65
South America	0.23	0.54	0.42
Europe	0.33	0.36	0.43
Middle East & Africa	0.04	0.10	0.32
Asia Pacific	0.03	0.03	0.03
Employee satisfaction, Pulse survey, overall, percent satisfied	76	76	77
Overall dealer attitude, Ford, relative ranking on a scale of 1–100 percent (winter/summer score)	85/85	85/85	83/81
Overall dealer attitude, Lincoln, relative ranking on a scale of 1–100 percent (winter/summer score)	77/77	77/78	77/78

1. See pages 25 and 82 of Ford's 2016 Form 10-K for definition and reconciliation to GAAP.
2. The decline in combined car and truck fuel economy is primarily due to customers purchasing larger cars and more trucks. Our combined fleet fuel economy improved by 10% compared to 2009.
3. Includes FFV Credit. The increase in combined car and truck CO₂ is primarily due to customers purchasing larger cars and more trucks. Our combined fleet CO₂ emissions improved by 10% compared to 2009.
4. Data for 2014 and 2015 has been restated to include three decimal places in line with EU COM published data. EEA/EU COM published preliminary 2016 CO₂ data. Official data expected in Q4 2017.
5. "Things gone wrong" and customer satisfaction data are based on model years.
6. Ford Action 14B04 (NHTSA Action Number of 14V343000) was superseded by 16S03 (NHTSA Action Number of 16V036000).
7. This data includes Ford and Lincoln.
8. 2014 data shows two decimal places to avoid a rounding discrepancy in the total.
9. 2015 data has been restated due to a rounding error.
10. 2015 data has been restated due to water meter repairs at a number of facilities.