

# Ford



**SUSTAINABILITY  
REPORT 2017/18**



[www.sustainability.ford.com](http://www.sustainability.ford.com)

# STRATEGY AND GOVERNANCE

**At Ford, we believe part of being a successful business is making a positive impact on the world. Our stakeholders expect and trust us to operate responsibly and transparently, living our promise to Go Further, the Right Way.**

*“We have always believed that freedom of movement drives human progress, which is why we aspire to be the world’s most trusted company, designing smart vehicles for a smart world. As we look to the future, we will move from reducing our impacts to contributing positively on the environment while also making people’s lives better through greater mobility, more connectivity, less congestion and reduced emissions.”*

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

**Jim Hackett**  
President and Chief Executive Officer

## LETTER FROM WILLIAM CLAY FORD, JR. AND JIM HACKETT

*“The purpose of any company should be to make people’s lives better. Otherwise, it shouldn’t exist.”*

Ford Motor Company was founded on the belief that freedom of movement drives human progress, and our aspiration is to become the world’s most trusted company by designing smart vehicles for a smart world. As a global company, our culture is made up of people with diverse backgrounds, opinions, experiences and perspectives from all over the world. Together, they help make our business stronger and foster a truly collaborative workplace.

Today, we continue to face challenges that affect lives around the world, from increasing congestion, air quality and the effects of climate change. Their implications are profound and the cost of not addressing them is too high.

We know climate change is real, and we remain committed to doing our part to address it by delivering on CO<sub>2</sub> reductions consistent with the Paris Climate Accord. We already have charted our course for the future that includes investing \$11 billion to put 40 hybrid and fully electric vehicle models on the road by 2022, as well as responsible development of the self-driving car.

As we look to the future, we know we can do even more around the world. We have a vision that will move us from just reducing our impacts on the environment to actions that will positively affect it.

In an increasingly electric and connected world, our vision for smart vehicles in a smart world will make transportation more efficient and accessible. New mobility solutions will help take vehicles off the road while providing community and connection.

For example, we are building the Transportation Mobility Cloud, an open platform that will allow for the orchestration of these mobility services in a system, and it will create a better experience for its users. Its promise is that it will support a more efficient transportation system that works to our advantage in reducing congestion, emissions and improving the overall quality of life.

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- [Letter From William Clay Ford, Jr. and Jim Hackett](#)
- [Our Sustainability Strategy](#)
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- [Governance](#)
- [Prioritizing Key Issues](#)

Even as these mobility solutions evolve to be different in the future than they are today, our core belief will remain constant: we will continue to work to make people’s lives better through greater access to mobility, more connectivity, less congestion and reduced emissions.

We will deliver smart vehicles for a smart world, and we will remain committed to doing what’s right to meet the challenges and opportunities that lie ahead.

## OUR SUSTAINABILITY STRATEGY

### OUR VISION

#### The Freedom to Move Drives Human Progress

In line with our expansion to be an automotive and mobility company, our long-term vision is not just about selling more cars. It’s about making people’s lives better with the freedom to move.

Our business model positions us to lead in areas with huge potential to revolutionize how people move – more efficiently and sustainably.

### OUR AIMS



#### Trusted Mobility

To become the world’s most trusted mobility company, designing smart vehicles for a smart world.



#### Driving Human Progress

To provide products and services that help create a better world and facilitate freedom of movement.



#### Positive Impact

To not just lower our footprint, but to develop product innovations that have a positive contribution to society.

### OUR ENABLERS

#### Building on Our Strengths

We’re prioritizing the strengths that differentiate us and help us stand out:



Cars

SUVs

Trucks

Electric Vehicles

by investing in our core business of:



Designing



Manufacturing



Marketing



Financing



Servicing

## Sustainable Growth

We're pursuing emerging opportunities in key areas by driving innovation at every level.

- **Electrification**
- **Autonomous Vehicles**
- **Mobility Services and Solutions**

### NAVIGATING A CHANGING WORLD

## Responding to Global Trends

Our strategy reflects the rapidly changing world around us. It recognizes seismic shifts in lifestyles, aspirations and global trends, as well as major challenges facing all of us, and the emerging technologies, such as electrification and autonomous vehicles, that can help address them.

- **Rapidly Growing Cities**
- **Shifting Lifestyles, Aspirations and Consumer Trends**
- **Climate Change**
- **Digitization and the Sharing Economy**
- **Congestion**
- **Air Quality Concerns**

### TO GO FURTHER

## We Are Working Toward Ambitious Long-Term Goals



### Global Mobility

We are focused on delivering our Ford Smart Mobility plan, providing solutions such as on-demand ride sharing to complement mass transit and continuing to invest in advanced vehicle technologies.



### Customers and Products

We continue to produce high-quality, smart, clean and safe vehicles that delight our customers, by pursuing fuel economy improvements, electrification, lightweighting, alternative fuels, sustainable materials and safety excellence.



### Operations

We have comprehensive programs in place to help us reduce energy and water use, greenhouse gas emissions and waste to landfill.



### Human Rights/Supply Chain

We aim to protect human rights, build supplier capacity, assess compliance, and improve the transparency of our mineral sourcing. We're also working to reduce our collective environmental footprint, build understanding of carbon and water footprints, and source from diverse suppliers.



### Health and Safety

The safety of our people is always a priority of the utmost importance. We will always target zero fatalities and serious injuries. We aim to drive continuous improvements and improve employee health.

Related Page:

> [Goals and Progress](#)

## 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

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. We are focusing on three key areas:

- **Reducing vehicle emissions**
- **Efficient, state-of-the-art manufacturing**
- **Supporting our suppliers to drive positive change**

Our strategy is also shaped by external factors, including government policies, physical risks such as extreme weather and other effects of climate change, market trends, and investor concern over climate change. For detail on these and other risk factors, see the [Ford annual report 2017 \(Form 10-K\), page 12](#).

You can read more about our progress on climate change from [Bill Ford and Jim Hackett](#).

Related Page:

> [Our Sustainability Strategy](#)

## Salient Issue

### Climate Change

During our first formal human rights saliency assessment, we identified climate change as one of our nine most important issues – those at risk of the most severe negative impact through Ford's activities and business relationships.

Going forward, we're taking steps to develop action plans to manage and remediate these issues, and to expand our reporting on them.

> [Find out more about our human rights saliency assessment](#)

### The Science Behind Our Strategy

Our climate change strategy is based on our commitment to do our share in limiting the global temperature increase to less than 2°C in line with the [Paris Climate Accord](#). Many scientists, businesses and government agencies have concluded that a 2°C limit may help to forestall or substantially delay the most serious consequences of climate change. This is extremely challenging and requires a major effort globally to stabilize carbon dioxide (CO<sub>2</sub>) concentrations in the atmosphere.

### How We Developed Our Approach



Based on climate science and modeling by recognized authorities, including the [International Energy Agency](#), we developed a model of global and light-duty vehicle (LDV) CO<sub>2</sub> emissions from different regions.



Using the model, we calculated the 2°C stabilization emission reduction levels for LDVs over time, resulting in "CO<sub>2</sub> glide paths" for the LDV sector, taking into account regional differences in vehicle size and fuel consumption, and biofuel availability.



We then calculated Ford-specific glide paths (CO<sub>2</sub> reduction goals) for our new vehicle lineups across our major operating regions. We also applied the methodology to determine CO<sub>2</sub> 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 CO<sub>2</sub> model is not intended to provide “the answer,” but a portfolio of possible vehicle and fuel solutions, as well as 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 for our long-term fuel economy and CO<sub>2</sub> emissions vehicle planning.

## Delivering Long-Term Reductions Across Our Lineup

We review our product development plans annually to ensure our vehicles are aligned with the 2°C stabilization glide path. While our plans are based upon delivering long-term reductions in CO<sub>2</sub> emissions from new vehicles that are similar to those for the industry-average LDV glide paths, we anticipate that the reductions will vary from year to year. This is due to market forces that we do not fully control, such as energy price fluctuation, changes in the mix of vehicles demanded by consumers and other factors that influence our product plans.

## Refining Our Model

Recognizing the long timeframe of climate science, we update our glide path model's assumptions and input data every five years. In 2017, we completed a major revision, moving to a 2°C temperature stabilization pathway, which is similar to our previous 450 ppm CO<sub>2</sub> concentration-based pathway. We also evaluated a 1.5°C sensitivity scenario. Our 2017 glide path is specific to LDVs,<sup>1</sup> instead of an all-sector pathway. Between major updates, we conduct other sensitivity analyses to understand the effect on the glide paths of global changes, such as economic conditions, biofuel availability or regulations. In 2018, we adjusted the model to account only for the physical CO<sub>2</sub> emissions from our vehicles and decoupled it from regional regulatory requirements. We are continuing to review the effects of recent LDV regulatory incentives such as electric vehicle multipliers (supercredits) that encourage new technologies but do not physically reduce CO<sub>2</sub> and our future vehicle fleet plans including increased electrification.

As climate science, alternative fuels and technologies advance, we will be considering ways to refine and adjust our science-based CO<sub>2</sub> targets in future updates – for example, how best to factor in emissions other than CO<sub>2</sub> – and how best to recognize the fact that to address climate change, cost-effective actions across different economic sectors are needed.

## Two Degree Scenario Analysis Framework

Investors are leading initiatives to establish common strategy and planning assessment tools to evaluate climate change risks and opportunities. Frameworks established for the oil and gas industry evaluate how scenarios, including policies, technology and market and climate trends, could impact their future business strategies and capital planning. Ford is engaging with [Ceres](#), a nonprofit organization encouraging companies to take stronger action on climate change, to develop and validate the framework for the automotive industry and complete the framework for Ford.

Related Page:

> [Our Climate Commitment](#)

1. IEA. Energy Technology Perspectives 2016. OECD/IEA, Paris (2016).

## OUR VALUE CHAIN AND IMPACTS

**To create value and reduce our footprint, we need to deliver a positive impact, both across Ford's direct operations and throughout the whole value chain.**

### Our Value Chain

#### 01 Design

We consider sustainability criteria in a holistic way during product design, as decisions made at this stage can have far-reaching impacts throughout the product life cycle.

#### Issues Addressed

Impacts at all stages of the product life cycle, e.g.:

- Sustainable, renewable and recyclable materials
- Product quality
- Occupant safety
- Material handling at end of life

#### Value Created

- New and better ways to move in future, leading to easier commutes, less congestion and improved air quality (see also [Vehicles in Use](#))
- Contributing to the circular economy, e.g., recycling and reusing materials
- Innovations are often shared with the automotive industry as a whole

#### 02 Materials and Suppliers

We depend on materials, parts and components from our suppliers, and work with them to encourage high environmental and social standards.

#### Issues Addressed

- Human rights and working conditions
- Conflict minerals
- Use of materials and natural resources
- Waste reduction
- Water use

#### Value Created

- Securing a sustainable supply of materials, goods and services through responsible sourcing
- Achieving tangible improvements for workers and the environment through supply chain management and engagement
- Contributing to local economies, entrepreneurship and livelihoods through our global procurement activity

#### 03 Logistics

With our logistics service providers, we focus on delivering inbound freight (components, parts, etc.) and transporting finished vehicles from our manufacturing facilities to dealerships in an environmentally efficient way.

#### Issues Addressed

- Fuel consumption
- Transport emissions and impact on climate change
- Packaging

#### Value Created

- Reducing road miles and optimizing efficiencies through a balanced transport mix
- Collaborating with partners and industry on methods to accurately measure and improve transport impacts
- Designing packaging to reduce materials use and waste

## 04 Manufacturing

By investing in world-class facilities, we drive innovation and excellence in vehicle manufacturing and production.

### Issues Addressed

- Use of materials and natural resources
- GHG emissions
- Water use
- Energy use
- Waste reduction
- Occupational health and safety
- Local community impacts (noise, congestion, etc.)

### Value Created

- Lean process innovations such as recycling
- Manufacturing process innovations that use less water, energy, etc.
- Socio-economic contributions (e.g., salaries for local workers, taxes paid to local governments)
- Promoting safe and healthy work environments

## 05 Sales and Service

The Blue Oval is recognized in Ford dealerships worldwide as a sign of quality, service and corporate citizenship.

### Issues Addressed

- Customer satisfaction
- The environmental impacts of our dealerships

### Value Created

- Dealerships provide local employment
- Recycling of used parts
- Fundraising and volunteering to support good causes

## 06 Our Vehicles In Use

The greatest impact we have is through our products. We innovate to achieve continuous improvement across our lineup while shaping transportation of the future.

### Issues Addressed

- Carbon footprint of our products
- Urbanization and congestion
- Air quality
- Driver and occupant safety

### Value Created

- Affordable fuel economy
- Mobility solutions (car-sharing and public transport apps, connected and autonomous vehicles, big data, fold-up bikes) that reduce congestion and pollution and positively affect the environment
- Improved road safety from driver assist technologies and safe driving courses

## 07 End of Vehicle Life

Designing in recyclability from the start is key to driving the circular economy, facilitating disassembly and enabling materials to be recaptured and reused at end of service.

### Issues Addressed

- Recyclable materials
- Waste reduction

### Value Created

- Closed-loop processes with materials going back into processing, e.g., aluminum recycling
- Making “waste” a valuable resource, stimulating demand for recovered and recycled materials
- Reduced waste to landfill and in oceans

## CONTRIBUTING TO THE UN SDGS

**Ford promotes the United Nations 2030 Agenda for Sustainable Development by communicating how our products and operations contribute toward achieving the UN Sustainable Development Goals (SDGs).**

### Our Priorities

We contribute toward meeting those SDGs that most directly relate to our business and where we can add most value. However, such global challenges require effective, multi-stakeholder collaboration at a local, national and international level. So as we strive to meet these ambitions, we also call on all our stakeholders and partners to join us in our efforts.

### What Are the SDGs?

In September 2015, the Member States of the United Nations adopted the Sustainable Development Goals (SDGs). The 17 Goals – and the 169 targets that lie behind them – form a new sustainable development agenda intended to end poverty, protect the planet and ensure prosperity for all.

> [Find out more about the UN SDGs](#)



### Good Health and Well-Being

*Ensure healthy lives and promote well-being for all at all ages*

#### Why Is This a Priority?

Health and safety is our number one priority. We are committed to ensuring the safety and well-being of our people in our facilities around the world, those in our extensive supply chain and when our customers get behind the wheel. Both health and safety and product quality and safety were identified as important human rights issues in our 2018 [saliency assessment](#).

#### How We're Contributing

- We take the [health and safety](#) of our people very seriously, working to ensure a safe working environment throughout our operations
- We are continually looking to develop [driver assist technologies](#) that improve the [safety performance of our vehicles](#) and strive to understand what our customers want and continuously improve the [quality of our vehicles](#) to meet their needs and expectations
- Our [Project Better World activities](#) include initiatives designed to improve health and well-being, enhance community life and [encourage safer driving](#)



## Clean Water and Sanitation

*Ensure availability and sustainable management of water and sanitation for all*

### Why Is This a Priority?

Access to safe drinking water and adequate sanitation is a fundamental human right, and was identified as a major issue in our 2018 [human rights assessment](#). Water resources are unevenly distributed and water security is high on the global agenda. Water is also critical to our manufacturing operations so we continually strive to reduce our water consumption, as well as that of our supply chain.

### How We're Contributing

- Focusing our [water strategy](#) on reducing our use of drinkable water and using more saltwater and wastewater
- Sharing best practice to help reduce the impacts of [water use in our supply chain](#)
- We leverage our resources, including [employee volunteers](#), to support [community projects through Project Better World](#) and environmental initiatives aimed at improving access to water, hygiene and sanitation



## Industry, Innovation and Infrastructure

*Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation*

### Why Is This a Priority?

Today's transportation networks are congested and inefficient, especially in urban areas. But we have an alternative vision of mobility in the future: an integrated system that employs advanced technologies, shared mobility services and autonomous vehicle technology to help people move more safely, confidently and freely.

### How We're Contributing

- Developing [alternative fuels and powertrain technology](#) with [improved fuel economy](#) and lower emissions, including significant investments in electrified vehicle technology
- Our research and development of [global mobility services](#) and [autonomous vehicle technology](#) to give people the freedom to move



## Sustainable Cities and Communities

*Make cities and human settlements inclusive, safe, resilient and sustainable*

### Why Is This a Priority?

Sustainable transport will provide access to safe, affordable, accessible and sustainable transport systems for all. Our mobility services and solutions will help the cities of tomorrow address a host of challenges. These range from traffic congestion to poor air quality, which was identified as an important human rights issue in our [formal saliency assessment](#) in 2018.

### How We're Contributing

- Our research and development of [global mobility solutions and services](#), from [self-driving vehicles](#) to the technology needed for [smart cities](#), will give people greater freedom of movement in the future
- We leverage our resources to support [Project Better World](#) initiatives that are designed to strengthen the communities in which we operate



## Responsible Consumption and Production

*Ensure sustainable consumption and production patterns*

### Why Is This a Priority?

Manufacturing vehicles requires using natural resources with a limited or even finite supply. Therefore, we need to use, reuse and recycle them efficiently and sustainably, reduce our dependence on petroleum-based plastics and move toward zero waste to landfill throughout our operations. To maximize our impact, we also seek to increase the resource efficiency of our supply chain. Product quality, the responsible sourcing of raw materials, forced labor and child labor were all highlighted as key issues in our 2018 [human rights assessment](#).

### How We're Contributing

- Directly managing the impacts of [our operations](#) by lowering energy consumption and reducing emissions from our [manufacturing](#) and [logistics](#), as well as responsible [water stewardship](#) and [waste reduction](#)
- Efficient resource use, including the use of [recycled, renewable and sustainable materials](#)
- Helping reduce the [environmental impacts of our key suppliers](#) through our PACE program
- Conducting due diligence to ensure the [responsible sourcing of raw materials](#) in compliance with local laws, reporting frameworks and respect for indigenous populations



## Climate Action

*Take urgent action to combat climate change and its impacts*

### Why Is This a Priority?

The production and use of combustion engine vehicles for transport contributes to climate change, negatively impacting people and communities. The scientific community has concluded that limiting global temperature increase to less than 2°C may help to delay the impacts of climate change. Both climate change and air quality were identified as key human rights issues in our [saliency assessment](#) in 2018.

### How We're Contributing

- Our comprehensive [climate change strategy](#) focuses on [reducing vehicle emissions](#), eco-efficient [operations](#) with lower [greenhouse gas emissions](#) and reduced energy consumption at our facilities, and helping our [suppliers reduce their environmental impacts](#)
- Our [electrification plans](#) are focused on delivering affordable electric vehicles at scale, to reduce the emissions associated with the use of our vehicles
- We are using [sustainable materials](#) to lower greenhouse gas emissions and energy use, and move away from plastics made from fossil fuels

## Supporting the Wider Goals

We also contribute to many of the other SDGs, illustrating the significant role that transportation and the freedom to move plays in increasing social mobility and driving human progress.



### Quality Education

*Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all*

We train our suppliers to address issues concerning human rights and working conditions in their facilities, and invest in education programs designed to build our future talent pipeline.

- > [Human Rights](#)
- > [Learning and Development](#)
- > [Environmental Impact of Our Suppliers](#)
- > [Building Sustainable Communities](#)



### Gender Equality

*Achieve gender equality and empower all women and girls*

We are an equal opportunity employer that respects and supports women across our business and supply chain, creating opportunities for empowerment and advancement.

- > [Human Rights](#)
- > [Diversity and Inclusion](#)
- > [Building Sustainable Communities](#)
- > [Supplier Diversity](#)

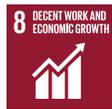


### Affordable and Clean Energy

*Ensure access to affordable, reliable, sustainable and modern energy for all*

We are working to meet more of our energy needs from renewable sources to reduce our reliance on fossil fuels and address climate change.

- > [Energy and Emissions](#)
- > [Emissions From Logistics Operations](#)



### Decent Work and Economic Growth

*Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all*

We are making employees' lives better, and improving retention and satisfaction levels, by creating a safe, collaborative and respectful workplace where employees can fulfill their potential, and encouraging our suppliers to do the same.

- > [Human Rights](#)
- > [Our People](#)
- > [Our Dealers](#)



### Reduced Inequalities

*Reduce inequality within and among countries*

Embracing all aspects of inclusion and equality better reflects the communities in which we operate, and the range of skills, opinions and experiences of a diverse workforce strengthens our business.

- > [Human Rights](#)
- > [Diversity and Inclusion](#)
- > [Supplier Diversity](#)
- > [Building Sustainable Communities](#)



### Peace, Justice and Strong Institutions

*Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels*

We seek to conduct our business in an ethical and responsible manner, with strong policies and governance structures in place to guide all aspects of our business, from human rights to customer privacy and data protection.

- > [Governance](#)
- > [Ethics and Compliance](#)
- > [Policy Letters and Directives](#)
- > [Public Policy](#)
- > [Human Rights](#)
- > [Responsible Sourcing of Raw Materials](#)
- > [Data Privacy and Security](#)



### Partnerships for the Goals

*Strengthen the means of implementation and revitalize the global partnership for sustainable development*

We are working with a range of partners to develop the next generation of mobility technology and services, to reduce the environmental impact of our business and to create a better world.

- > [Global Mobility](#)
- > [Collaborating for Human Rights](#)
- > [Collaborating on Water](#)
- > [Environmental Impact of Our Suppliers](#)
- > [Building Sustainable Communities](#)

## GOVERNANCE

**High standards of governance are essential if we are to maintain the trust of all our stakeholders. Importantly, all sustainability-related structures, processes and management systems are integrated within the business, ensuring our business operations are transparent and accountable.**

### Corporate Governance

Our [Board of Directors](#) is guided by our Corporate Governance Principles, Code of Ethics and charters for each Board Committee. These 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

To continually improve our performance and deliver on our plans, we are guided by our Creating Value Roadmap. Across our business we employ a variety of governance systems and processes to manage the different aspects of sustainability, and these are summarized throughout this report.

As well as 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.

Strategy and  
GovernanceCustomers  
and Products

Operations

People and  
SocietyPerformance  
and Data

## 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 global skill teams to integrate sustainability throughout the company by aligning with the most relevant and actionable United Nations Sustainability Development Goals where we make the largest impact
- Chairs the leadership forum to govern skill teams' now, near and far sustainability goals and metrics

## Key Business Processes

Key governance processes enable us to manage issues that cut across functional areas.

### Creating Value Roadmap Process

Our Creating Value Roadmap Process (CVRP) is the model for how we run the company. It contains the management processes we follow to continually improve our performance and deliver on our plans.

The CVRP, institutionalized as Policy Letter 25, enables us to continually monitor the ever-changing global business environment for risks and opportunities, including those related to sustainability, and use the resulting analysis to inform our strategies as needed. It also creates stronger accountability for setting, tracking and reporting progress against our goals and objectives, revenue targets, other financial indicators and stakeholder satisfaction measures.

The processes set out below allow us to respond to new internal and external developments in a timely manner and use these evaluations to adjust our management approaches where necessary.

- **Business Plan Review (BPR):** The senior leadership team (representing all skill teams and business units) holds meetings on a regular basis 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 senior leadership team reviews significant matters in more detail, and develops action plans and strategies to address more specific risks and opportunities

## Business Plan Development and Compensation

As part of our annual business planning process, our business units track their performance using scorecards. Sustainability targets are integral to companywide achievements and are translated into product manufacturing and financial performance metrics. These metrics contribute to performance assessment for managers at various levels of the company and affect their compensation.

## ETHICS AND COMPLIANCE

**As Ford continues to grow, we work hard to ensure that ethics and compliance remain the foundation of all our business practices. 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 ensuring ethical business practices to managing our supply chain.**

### Ethics Advice at Our Fingertips

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. To help our employees to do things the right way, we provide them with the information they need, when and where they need it. To support this, our Corporate Compliance Office – which promotes a culture of compliance and ethics across our business, turning our aspirations and high standards into action – has developed innovative training and communication tools that make knowing how to comply with corporate policy and the law as easy as possible.

Related Page:

> [Governance](#)

These tools include a free mobile app, The Right Way. This app puts key compliance information at our employees' fingertips, providing answers to frequently asked questions. Topics covered include our human rights commitment, the signs of human trafficking, our stance against harassment and discrimination, and our strict policy against [bribery and corruption \(see next page\)](#). Employees can also use the app to contact the Compliance Office directly.

The *Right Way* app is available in seven languages, making it accessible across our global workforce. It is also publicly available, which means our suppliers and other business partners can use it to become more familiar with our ethical policies and practices. We have also made it available as "open source" material for other companies and groups to build on.

Related Page:

> [Public Policy](#)

### Ethics and Compliance Training

Our many [Policy Letters and Directives](#) formally establish expectations for our employees and others working on our behalf. Our primary ethical guidance document is our [Code of Conduct Handbook](#), which contains the most important and relevant of our letters and directives. The Code is available in 14 languages to ensure accessibility to employees around the world.

Our compliance program is reinforced by 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 continuously work to improve our online training courses to offer shorter, more frequent and more memorable modules. This includes honing our annual Code of Conduct online training module, presenting timely topics that will be meaningful and thought-provoking for our employees. The first module in this refreshed series launched in the fall of 2017 and featured a leading researcher who spoke on being mindful of ethical challenges in a talk entitled *Why Do Good Companies Do Bad Things?* We had such a strong positive and thoughtful response from employees around the globe that we are following up with a timely module in the fall of 2018. Encouraging everyone to think about how we interact, the module, called *Civility: The High Cost of Bad Behavior*, will be presented by a leading expert. We look forward to continuing to encourage dialogue around business ethics and compliance.

Related Page:

> [Policy Letters and Directives](#)

## 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 report such violations anonymously to the General Auditors' Office, Human Resources or the Office of the General Counsel, using telephone hotlines, website or via email. All allegations are reviewed by a cross-functional committee, which also oversees the investigations, and implements corrective or disciplinary actions.

## Anti-Bribery and Anti-Corruption

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

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

## Case study

### An Ethical Corporate Citizen

We are absolutely committed to being a good, ethical corporate citizen. Our efforts were recognized by several third-party organizations in 2017. Forbes named Ford to its [The Just 100: America's Best Corporate Citizens](#) and [2018 America's Best Employer](#) lists, and we scored 100 percent on the [Human Rights Campaign's Corporate Equality Index](#).

## POLICY LETTERS AND DIRECTIVES

**We use Policy Letters to establish a framework of broad, basic principles within which we conduct our business across the world. Corporate Directives provide more in-depth information on narrower topics, or relate only to specific business segments. A variety of business standards and practices, handbooks and guidelines are also used to govern the conduct of our people globally.**

The following corporate standards have a particular relevance to sustainability.

### Anti-Bribery and Anti-Corruption

We comply fully with the laws of each country in which we do business. In particular, we never pay bribes, nor do we allow others to pay bribes for us. All our employees are directed to report any requests or solicitations for improper payments through our companywide reporting systems. We also have [ethical standards](#) that govern and restrict the types of entertainment, gifts and favors that our workers can give and accept.

### Diversity and Inclusion

We recognize that a diverse workforce is a valuable asset, and are committed to equal opportunity throughout every aspect of our business. We strive to provide an inclusive work environment in which 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

Every single person at Ford has responsibility for protecting health, safety and the environment. The importance of sustainable economic development – for both Ford and for society in general – is highlighted in our company policies. We regularly review our products, services, processes and facilities against objectives and targets that are designed to minimize waste and pollution from our [operations](#) and those of our suppliers, as well as any adverse impact on workers' [health and safety](#).

### Human Rights

Ford is committed to human rights across our global operations and supply chain. This commitment is embodied in [Policy Letter 24: Ford 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, harassment and discrimination, human trafficking, child labor, forced labor, health and safety, 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

In 2018, we conducted a [saliency assessment for human rights](#), the first original equipment manufacturer (OEM) to complete such an assessment.

### 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

Building long-term relationships and delivering excellent products and services requires the trust and confidence both of our customers and of our employees. A key issue in maintaining that trust is [data privacy and security](#). We recognize that customers, employees and others have concerns about this and naturally 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 continuously improving the quality of our products and promoting customer safety. Our quality policy (Policy Letter 1) emphasizes the importance of quality in everything we do, and recognizes that quality is defined not by Ford, but by our customers. Sustaining and improving the [quality of our products](#) also depends on collaboration between employees, suppliers and dealers.

Our Quality Operating System (QOS), and our use of key metrics, helps us 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 our QOS. Our 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.

### Social Media Interactions

We recognize the growth and importance of social media, such as Facebook, Twitter and Instagram, as well as blogs and online discussion forums, and encourage our employees to use them responsibly. Our [Digital Participation Guidelines](#) outline what is expected of them when using 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 our [Policy Letter 24](#). This policy addresses workplace issues including working hours, child labor, forced labor, non-discrimination, freedom of association, health and safety, and the environment, and is supplemented by web-guides on a range of topics. The policy applies to our own operations, but we also encourage businesses we work with throughout our supply chain to adopt similar policies.

Related Page:

> [Governance](#)

## PUBLIC POLICY

**Every day, around the world, governments make decisions that in turn have an impact on our business. As a global company, it is important that, wherever we operate, we have a voice in policies that affect our business. We must also continue to be recognized as a credible source of information to help shape those policies.**

### Supporting the Policy-Making Process

We seek to support our business interests by participating openly and transparently in the political process. Our aim, across a range of issues, is to be part of the solution. We support local, regional, national and international policies that are economically, environmentally and socially sustainable for our company, our customers and their communities.

In our major markets, on issues of the highest priority, we maintain regular dialogue with legislators and regulatory officials. We share our expertise and add our perspective to the policy-making process, which is overseen by our Government Affairs offices around the world.

## Advocacy Through Coalitions and Associations

To leverage our resources more effectively on important issues, we work with numerous external partners. 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.

This work helps us develop and promote policies that could have far-reaching benefits for our company, our industry and society as a whole.

Of course, there are times when our views may not align with those of the associations to which we belong. In such cases, we always reserve the right to speak with our own voice and make our own stance clear.

One such instance was in response to the midterm evaluation of greenhouse gas (GHG) standards, when we made our position clear: *"We support increasing clean car standards through 2025 and are not asking for a rollback. We want one set of standards nationally, along with additional flexibility to help us provide more affordable options for our customers. We believe that working together with EPA, NHTSA and California, we can deliver on this standard."*

Related Pages:

> [Policy Letters and Directives](#)

> [Ethics and Compliance](#)

## PRIORITIZING KEY ISSUES

**A formal materiality process enables us to define our reporting priorities, identify emerging sustainability issues, shape our sustainability strategy, set goals and allocate resources. We capture the resulting priority topics in a matrix, which provides a snapshot of the challenges, opportunities and connections between those sustainability issues of most importance to our business and those of highest concern to our stakeholders.**

### Materiality Results

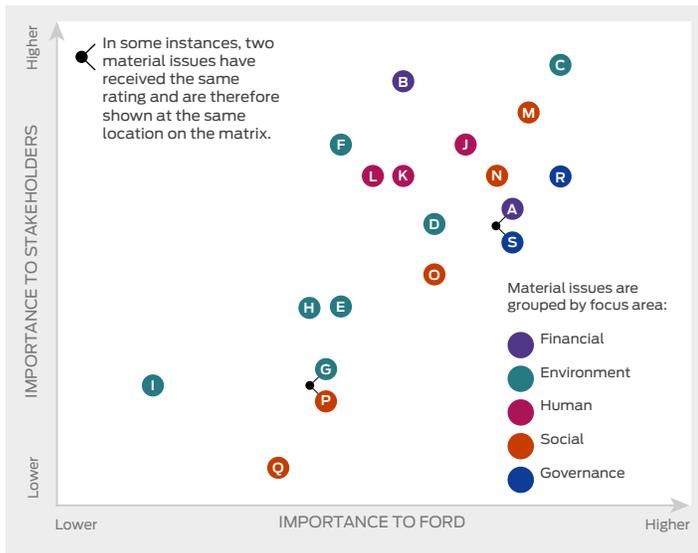
Our most recent materiality analysis was carried out in 2016 and early 2017. The results are reflected in the matrix on the next page.

The analysis identified our most important issues as:

- 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, 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.

## MATERIALITY DEFINITIONS AND METHODOLOGY

We published our first materiality analysis in our 2004/5 Sustainability Report, making us an early adopter of materiality in the sustainability context. We update our assessment every other year, and this report contains our most recent analysis.

### Definitions of Materiality

For the purposes of this report, we consider material information to be that which is of greatest interest to, and 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."

Related Page:

> [Prioritizing Key Issues](#)

## Our Materiality Process

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



### Identification

We created a list of potential issues, grouped by four different types of "capitals" – social, environmental, financial and human – as well as governance. Issues were identified through desk-based research, which included a peer review, media scan and review of sustainability thought leadership from industry experts and associations.



### Prioritization

Once potential issues had been identified, internal and external stakeholders were invited to comment on the topics and rate them in terms of their perceived importance. Internal stakeholders came 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. The interviews were analyzed to identify key challenges, opportunities and linkages between the issues. Average ratings were obtained from both groups of stakeholders.



### Review

Once the materiality analysis was completed, the results were reviewed internally by Ford's Sustainability & Vehicle Environmental Matters (S&VEM) group and regional stakeholders. Revisions were then made to ensure that our process and list of important issues were complete, well understood and inclusive of the perspectives obtained from stakeholders, and that all feedback was appropriately reflected.

Related Pages:

> [Stakeholder Review of Report](#)

> [Stakeholder Engagement](#)

## 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.

## Strategy and Governance

## Customers and Products

## Operations

## People and Society

## Performance and Data

**Communities**

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

67 Ford manufacturing sites

**Customers**

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

6.6 million vehicles sold

**Dealers**

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

11,428 dealerships worldwide

**Employees**

- 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

202, 275 employees worldwide

**Investors**

- 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

More than 120,000 stockholders

**Suppliers**

- 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

Total global spend of \$110+ billion

**Engagement on This Report**

Among the specific reviewers of our report are our Sustainability and Innovation Board Committee, the Global Executive Leadership team, global subject matter experts, the SE&SE Vice-President, Ceres, employees, sustainability think tanks and non-automotive corporations.

We also specifically engage with a Ceres Stakeholder Committee when producing this report, giving us a wider, multi-stakeholder perspective on sustainability topics. For details of their feedback and our responses, see the [Stakeholder Review of Our Report](#).

**STAKEHOLDER REVIEW OF REPORT**

**For this Sustainability Report, as with our previous 11 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.**

The Ceres Stakeholder Committee, which was convened in March 2018, 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.

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

**Recommendation: Fuel Economy and GHG Standards**

**Ford response:** We work with numerous external partners to leverage our resources more effectively on key issues. As part of this approach, we belong to a broad range of partnerships, coalitions, industry groups and trade associations that advocate on behalf of their members for legislation and regulation. Our work with these partners helps us develop and promote policies that could have far-reaching benefits, not just for our company but for our industry and society as a whole.

On occasion, our views may not align with those of the associations to which we belong, and we always reserve the right to speak with our own voice and make our own stance clear.

**Recommendation: Addressing Harassment and Gender-Based Discrimination**

**Ford response:** Ford restated its full commitment to creating a workplace free of discrimination and harassment and the need to consider new management tactics with the company's Human Resources team and Chief Diversity Officer (who currently reports to the Chief Human Resources Officer). Ford has taken several steps in the wake of public stories outlining the conditions at its Chicago manufacturing operations and the senior leadership team is keenly focused on this issue as well. Ford also noted ongoing conversations about an external advisory council with Michigan State University, which recently created a similar body. Ford is committed to a pay equity strategy, which was reviewed with the Board of Directors.

**Recommendation: Accountability in Supply Chain Management**

**Ford response:** Ford switched from internally developed audit systems to the [Responsible Business Alliance \(RBA\)](#) audit framework in 2016 (concurrent with the company joining the RBA as its first automobile manufacturer member), and thus did not have additional data to disclose in its most recent Sustainability Report. The company has since applied the new audit framework to a range of suppliers, including technology suppliers, interiors, and key raw commodities. In this report, Ford is publishing data and is able to disclose year-over-year information.

**Recommendation: Operational Eco-Efficiency**

**Ford response:** Ford knows there are several corporate campaigns that the company could take advantage of, but the company has to weigh where it will get maximum benefit for the resources invested. Additionally, Ford recognizes there are several opportunities for the company to disclose more information about the environmental impacts associated with specific materials and, more importantly, material substitutions.

**Recommendation: Transportation Electrification**

**Ford response:** Ford agrees that it has a role to play at each level of government to support policies and investments that will help grow the market for electric vehicles, particularly investments in charging infrastructure. Ford also noted several recent or continuing instances of relevant support, including:

- Being the first OEM to push for maintenance of the electric vehicle tax credit
- Not advocating against the Zero Emission Vehicle (ZEV) mandate while also talking with California about what ZEV looks like for medium and heavy-duty vehicles
- Working with Ionity (and a group of other OEMs including BMW and VW) on infrastructure development in the EU and actively looking for similar opportunities at the local level in the United States (e.g., in Lansing, MI)
- Contributing to a fund for the purpose of educating consumers on this and engaging with several New England states to identify additional opportunities to support market development, learning from and building on successful initiatives in other states

**Recommendation: Renewable Energy Procurement**

**Ford response:** We have met our 2025 goal of reducing emissions per vehicle produced by 30 percent relative to a 2010 baseline eight years early, achieving a 32 percent reduction. The company's success was attributable in part to its use of renewable energy as well as energy conservation measures.

Related Page:

> [Stakeholder Engagement](#)

# CUSTOMERS AND PRODUCTS

**We produce high-quality, smart, safe vehicles. And we go further to make them better – for customers, the planet, and everyone on it.**

**In this section**

- [Reducing Vehicle CO<sub>2</sub> Emissions](#)
- [Using Sustainable Materials](#)
- [Product Quality and Customer Satisfaction](#)
- [Improving Vehicle Safety](#)

## What Our People Say

*“My goal is simple: to make our vehicles with as many renewable materials as possible. My team and I look for bio- and plant-based waste streams and literally turn it into car parts. After decades of research, we’ve accomplished some pretty remarkable innovations. But the road to a more sustainable vehicle hasn’t always been easy.”*

**Debbie Mielewski**

Senior Technical Leader in Materials Sustainability, Ford

## REDUCING VEHICLE CO<sub>2</sub> EMISSIONS

We acknowledge that climate change is real and that we share the responsibility for reducing greenhouse gas (GHG) emissions in our products. We are committed to making more efficient, lower-impact vehicles and technologies accessible at scale, to make people’s lives better.

### HOW WE’RE DRIVING CHANGE

#### A Smart Approach to CO<sub>2</sub> Reduction

We recognize that there’s no single way to improve fuel efficiency and/or vehicle CO<sub>2</sub> emissions. That’s why we take a portfolio approach across the three areas of vehicles, fuels and customers:



#### Smarter Vehicle Choices

Offering affordable, accessible lower-carbon options:

- Electrified vehicles
- New engine/transmission technologies
- Electrical system improvements
- Aerodynamic improvements
- Weight reductions
- Advanced powertrain options



#### Smarter Fuel Choices

Evaluating, developing and introducing vehicles that use lower-carbon fuels:

- Electricity
- Biofuels
- Compressed natural gas (CNG)
- Liquefied petroleum gas (LPG)



#### Smarter Driving Choices

- Giving customers the choice of which vehicles and fuels to purchase and how those vehicles will be driven and maintained
- Promoting “eco-driving” through training, information and vehicle technology to help customers minimize fuel consumption and emissions

## OUR PERFORMANCE

### Lower Emissions Across Our Portfolio

Our approach to improving fuel efficiency and cutting vehicle emissions spans new powertrain technology, electrified vehicles and lower-carbon fuels.

- **40** new electrified vehicles to be launched by 2022
- Our combined fleet fuel economy has **improved by 9%** compared to 2009
- **\$11 billion** investment in electrified vehicle development, some of which was deferred from traditional internal combustion engine (ICE) investment

## OUR PLAN FOR REDUCING VEHICLE EMISSIONS

Our science-based global strategy aims to reduce the greenhouse gas (GHG) emissions from our vehicles (as well as our operational processes). Encompassing our Sustainable Technologies and Alternative Fuels Plan, the strategy seeks to deliver high-quality products that meet consumer demand while also responding to the risks presented by climate change.

### A Long-Term Approach to Cutting CO<sub>2</sub> Emissions

In collaboration with policy-makers around the world, we continue to reduce vehicle emissions in line with regional “glide paths.” These trajectories define the industry-wide emissions reductions needed to stabilize the changing climate.

Related Page:

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

Our industry faces major challenges in this area right now. As well as regulatory uncertainty in the United States, there’s a general switch among customers from cars to trucks and SUVs. In addition, as U.S. fuel prices have been low in recent years, the public prioritization of fuel efficiency has changed. Customers’ expectations and priorities are evolving, turning toward other attributes in their vehicles, such as performance, connectivity and infotainment. This has made it more challenging to get their buy-in for more efficient yet more expensive fuel economy-related technologies.

Nonetheless, we have followed an ambitious plan to improve fuel economy and reduce CO<sub>2</sub> emissions across our product portfolio over the past decade and remain committed to emissions reductions and electrification over the long term.

#### How We’re Doing

- Ford’s U.S. corporate average fuel economy (combined car and truck) is **29.6<sup>1</sup>** miles per gallon
- Ford’s U.S. CO<sub>2</sub> tailpipe emissions (per vehicle, combined car and truck) is **360<sup>2</sup>** grams per mile
- Ford’s Europe CO<sub>2</sub> tailpipe emissions (per passenger vehicle) is **121 grams per kilometer**

## Global Technology Migration Path

### Now (<2021)



#### Policy and Mobility

- First Ford car sharing
- First Ford bike sharing
- First Chariot cities



#### Internal Combustion Engine (ICE)

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



#### Electrification

- Start-Stop systems introduced
- Hybrids/Plug-In Hybrids available in nearly 40% of nameplates
- Focus BEV: 115-mile EV (electric vehicle) range



#### Alternative Fuels

- Develop SI (spark ignition) and CI (compression ignition) technologies compatible with low-carbon/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

- 8- and 10-speed variants expand to replace 6-speed automatic transmissions



#### Weight Reduction

- Significant weight reduction programs using conventional materials

### Near (2021-2024)

- Existing technologies at high volume
- Reduce weight
- Expand electrification



#### Policy and Mobility

- Initiate cross-sector GHG mitigation discussions
- Progress cross-industry and government discussions to increase minimum octane rating
- Introduction of autonomous vehicle (AV) technologies
- Introduction of commercial vehicle (CV) advanced technologies
- Introduction of smart mobility technologies
- Extend sharing and shuttle offerings in regions
- Extended FordPass functionalities including parking finder, etc.
- Intermodal platforms



#### Internal Combustion Engine (ICE)

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



#### Electrification

- Expand electrified driveline and transmission technologies
- More efficient hybrid-specific engines
- Start-Stop widely available
- Hybrids/Plug-In Hybrids available in nearly 50% of nameplates
- BEV: ~300-mile EV range



#### Alternative Fuels

- Vehicle and powertrain capability to leverage renewable fuels
- Expand product capability for renewable fuels



#### Energy Management, Electrical Architecture and Efficiency

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



#### Transmission and Driveline

- Advanced conventional driveline technologies widely available
- Further develop electrified transmission and driveline technologies across all platforms and powertrain configurations



#### Weight Reduction

- Significant weight reduction programs using conventional and advanced materials

### Far (2025+)

- Electrification and alternative fuels at high volume



#### Policy and Mobility

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



#### 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

Strategy and Governance

Customers and Products

Operations

People and Society

Performance and Data



**Electrification**

- Next-generation Hybrid, Plug-in Hybrid and BEV technologies (lighter, smaller, reduced cost, improved functionality)
- BEV models with 300+ EV range available in a growing number of segments
- Continued expansion of all-electric vehicles across portfolio



**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 electrified and autonomous vehicles



**Weight Reduction**

- Development of advanced lightweight material models progresses

Related Pages:

- > [Climate Change Strategy](#)
- > [Alternative Fuels and Powertrains](#)
- > [Operations](#)

1. Includes FFV credits. Does not include A/C or Off-Cycle credits.

The decline in combined car and truck fuel economy of 1% YOY is primarily due to customers purchasing larger cars and more trucks and reduced CAFE FFV credits. Despite the decrease in combined car and truck CAFE, on an individual basis, [our vehicles continue to make fuel economy improvements](#) and our combined fleet fuel economy has improved by 9% compared to 2009.

2. Includes FFV credits. Does not include A/C or Off-Cycle credits.

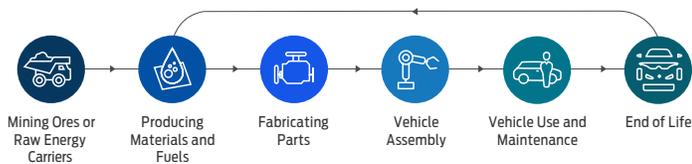
## TAKING A LIFE CYCLE APPROACH

We want to understand all the impacts our products and services have, so that we can manage them more effectively. To do this, we need to look at them holistically, over their entire life cycle. This wider view means we are better able to reduce our environmental footprint, through the materials and energy we use to make our vehicles, and the emissions generated by using them.

### Assessing Total Life Cycle Impacts

We use a growing range of analytical tools to identify and measure the potential environmental impacts of our products or services over the entire lifetime of our vehicles. This spans the mining of the ores and metals used in their manufacture, through production, distribution and use, to their end-of-life disposal.

#### Our Product Life Cycle



### Greenhouse Gas Emissions in the Vehicle Life Cycle

Greenhouse gases (GHGs) emitted by our vehicles during use are largely determined by factors such as the number of vehicles on the road to the way they are driven. Unlike [facility GHG emissions](#), where we can track energy and other data accurately, we estimate emissions from the use phase by utilizing both sophisticated modeling and actual vehicle testing.

### 2017 GHG Emissions From Ford Operations and Use of Sold Products

|                      | <i>Million metric tons</i> |
|----------------------|----------------------------|
| Ford Facilities      | <b>3.1</b>                 |
| Per Vehicle          | <b>0.47</b>                |
| Use of Sold Products | <b>161</b>                 |

To date, much of our work to improve the life cycle performance of our products has focused on their tailpipe – or tank-to-wheels (TTW) – emissions. However, we continue to study the well-to-wheels (WTW) impacts, which account for the effects of both the production and consumption of the fuels our products use. Estimates of WTW emissions vary with the specifics of the vehicle, engine and fuel type.

When comparing vehicles, diesels generally have lower lifetime GHG emissions than their gasoline-powered equivalents. In vehicles with alternative powertrains (i.e., electrified), overall CO<sub>2</sub> emissions are dependent on the carbon intensity of the fuel production process. The emission benefits of lower-carbon options such as [BEVs and PHEVs](#) are maximized when the electricity used is generated from renewable sources such as wind or solar power.

While the GHG impacts from fuel production are part of the total vehicle life cycle, they are not within our control and need to be addressed separately. To find ways to reduce GHG emissions during this stage of the life cycle, collaboration with other stakeholders such as fuel producers, infrastructure developers and government is essential.

Related Page:

- > [Alternative Fuels and Powertrains](#)

### Water Use in the Vehicle Life Cycle

To assess the water footprint of our vehicles, we have estimated whole life cycle use for a model year 2012 Ford Focus: the internal combustion engine vehicle (ICEV) and the battery electric vehicle (BEV).

#### Ford Focus 2012 – Estimated Life Cycle Water Use

|                      | <i>Life Cycle Water Withdrawal (Water Withdrawn From a Source) – Estimated U.S. Average (m<sup>3</sup>)</i> | <i>Life Cycle Water Consumption (Water Permanently Lost From a Source) – Estimated U.S. Average (m<sup>3</sup>)</i> |
|----------------------|---|---|
| Ford Focus 2012 ICEV | 530   | 130   |
| Ford Focus 2012 BEV  | 3,770   | 170   |

There is a notable increase in the water withdrawal associated with the use phase of the BEV; this reflects the amount of water needed for electricity generation and, in particular, the cooling in coal, nuclear and natural gas power plants. In comparison, much less water is needed to produce petroleum fuels.

This highlights the importance of reducing the water consumption associated with fuel production, as well as increasing vehicle energy efficiency.

As well as assessing the water footprint of our vehicles, we're working on a change in how [we use and recycle water](#).

### Applying Our Findings

We use our life cycle assessment (LCA) knowledge in research and development using, for example, our Product Sustainability Index (PSI) in Europe. This tool assesses various factors, from global-warming and air-quality potential to the use of sustainable materials, external noise, safety and ownership costs. Through the PSI, we have been able to demonstrate improved environmental, social and/or economic performance over the life cycle of several European models.

Related Page:

- > [Data: Vehicle Fuel Economy and CO<sub>2</sub> Emissions](#)

We also use LCA when assessing the environmental and cost impacts of different materials. We are currently studying the energy and GHG emissions associated with the production of carbon fiber automotive parts, and comparing these impacts to any fuel savings they can provide.

## Driving the Science of Sustainability

We believe that addressing climate change requires a multi-sector approach, in which the cost-effectiveness of approaches to reduce CO<sub>2</sub> will be critical.

We are conducting research that compares the cost-effectiveness of actions to achieve emission reduction targets in sectors facing high abatement costs (such as transport) with those in other sectors (such as the energy sector, with respect to fuel production). Our researchers have also contributed to a cradle-to-grave LCA that explores the costs and GHG emissions of current and future technology for light-duty vehicles.

Related Pages:

- > [Improving Fuel Economy](#)
- > [Addressing Non-CO<sub>2</sub> Emissions](#)

## IMPROVING FUEL ECONOMY

**We use a variety of approaches to improve the fuel economy of our gasoline- and diesel-powered vehicles, guided by our Sustainable Technologies and Alternative Fuels Plan. Improving fuel economy goes hand-in-hand with our work on [electrification](#).**

## Advances in Engine and Transmission Technologies

### Gasoline Engines

Thanks to turbocharging and direct fuel injection, our range of EcoBoost® engines are the standard bearers of our efforts to deliver significant fuel-efficiency gains and reduced CO<sub>2</sub> emissions in gasoline-powered vehicles. This award-winning fuel-saving technology has been used in 8 million engines worldwide.

We are investigating and developing new technologies to improve performance, fuel economy and emissions for multiple powertrain options, such as advanced boosting, reduced friction, and advanced fuel injection and ignition. We also continue to assess the role of [low-carbon renewable fuels](#) on CO<sub>2</sub> reduction and how they may influence future designs.

Additionally, as electrification/hybridization expands to a broader spectrum of segments and markets, we are further developing engines optimized for the various hybrid powertrain configurations and customer requirements.

Reflecting some of the progress we've made in gasoline engine production, the 2.0-liter inline four-cylinder gasoline direct injection engine with Auto Start-Stop in the 2018 Transit Connect Cargo Van is E85-compatible and connected to an 8-speed automatic transmission.

### Advanced Transmissions and Drivelines

Along with our new EcoBoost® engines, the 10-speed automatic transmission used in our new Ford Expedition and Lincoln Navigator improves powertrain efficiency and vehicle performance/drivability. Ideal for hauling heavy payloads and towing trailers, we first incorporated it into the 2017 F-150 4x2 and 4x4 models.

We continue to develop our front- and rear-wheel-drive transmissions to increase efficiency and improve vehicle performance while enabling quick, smooth shifts. We are also developing driveline technologies to reduce parasitic losses while enhancing function and drivability, including low-friction all-wheel-drive systems.

## Diesel Engines

Diesel engines continue to be a popular option in specific markets and segments, due to their excellent drivability, CO<sub>2</sub> emissions and fuel consumption characteristics, especially under heavy load operation. Modern diesel engines can achieve 20-30 percent better fuel economy than comparable gasoline engines. They also emit 10-20 percent less CO<sub>2</sub> on a [well-to-wheels \(WTW\)](#) basis.

In North America, for example, we're offering two new advanced diesel engines: the 1.5-liter EcoBlue® engine in our 2019 Transit Connect and the 3.0-liter Power Stroke - the first diesel engine for an F-150. Both of these demonstrate the fuel efficiency and power performance that progressive diesel engines can provide.

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

Related Page:

- > [Alternative Fuels and Powertrains](#)

## Case study

### Improving Air Quality Through European Scrappage Scheme

In August 2017, we launched a car and van scrappage scheme aimed at reducing vehicle emissions and improving air quality in several European markets, including the U.K. and Germany. It enables owners to trade in their old vehicles for new, affordable Ford cars and commercial vehicles with EcoBoost petrol and EcoBlue diesel models; these meet the Euro 6 standard, the toughest vehicle emissions yet.

We then extended the scheme into the first quarter of 2018, which has now seen more than 10,500 vehicles scrapped and replaced with cleaner, more fuel-efficient vehicles.

**We've scrapped more than 10,500 vehicles and replaced them with cleaner, more fuel-efficient vehicles.**

### Reducing Vehicle Weight

We are adopting advanced lightweight materials to help reduce fuel consumption wherever practicable. For example, when we switched to an aluminum body on the 2015 F-150, we were looking to lead the way toward making aluminum the industry standard for automakers.

Related Page:

- > [Data: Vehicle Fuel Economy and CO<sub>2</sub> Emissions](#)

We put our largest vehicles on a strict diet, and aluminum was the right choice: the switch helped the F-150 drop almost 700 pounds! According to an annual life cycle study by the Automotive Science Group, the F-150 leads the full-size light-duty truck competition in all environmental and economic performance areas. This significant weight reduction led to improved fuel economy and provided increased payload and towing capability, which are important attributes for the truck customer.

The F-series logged its 41st consecutive year as the nation's best-selling pickup in 2017, and will be the first full-size pickup to crack the 30-mpg barrier with a diesel engine.

Building on this success, we also reduced vehicle body weight by 200 pounds on the 2018 Lincoln Navigator, 300 pounds on the 2018 Ford Expedition and 350 pounds on the 2017 Ford Super Duty by switching to aluminum. We will maintain this fresh approach to materials in new vehicles as we continue to drive innovation and improve mobility.

“Aluminum for us is about more than weight: it handles better, brakes faster, hauls more, tows more. We were able to put that weight savings into more capability for the customer. We thought it was the perfect material for what customers do with their vehicles.”

**Brian Bell**

Marketing Manager, Ford Motor Company

Related Pages:

- > [Our Plan for Reducing Vehicle Emissions](#)
- > [Addressing Non-CO<sub>2</sub> Emissions](#)

## ALTERNATIVE FUELS AND POWERTRAINS

**Our plan to develop sustainable technologies and alternative fuels includes researching and developing alternative powertrains and fuel options across all our vehicles, delivering on our promise to give customers the power of choice.**

### En Route to Lower-Carbon Fuels

As part of our strategy to support global [climate stabilization goals](#) and a more sustainable portfolio, we have developed a roadmap for migrating our vehicle technologies toward the use of lower-carbon fuel options. We offer a range of powertrain and fuel options that are designed to reduce vehicle CO<sub>2</sub> emissions and improve fuel efficiency.

Our plan to progress sustainable technologies and alternative fuels includes researching and developing alternative powertrains and fuel options across all our vehicles, delivering on our promise to give customers the power of choice.

Related Page:

- > [Data: Vehicle Fuel Economy and CO<sub>2</sub> Emissions](#)

### Global Fuels Migration Path

#### Now (<2021)



**Gasoline and Diesel**

- Growth of fossil fuel continues with developments in extraction technologies



**Electricity (HEV, PHEV, BEV)**

- Electricity grids start to transition to low-CO<sub>2</sub> future
- Implementation of renewable energy, including solar and wind



**Renewable Biofuels**

- Gasoline/diesel fuel quality improvements



**CNG and LPG**

- CNG and LPG available in limited markets

#### Near (2021–2024)



**Gasoline and Diesel**

- Gasoline/diesel fuel quality improvements



**Electricity (HEV, PHEV, BEV)**

- Electricity grids continue to transition to low-CO<sub>2</sub> future
- Fleet programs confirm grid/infrastructure readiness for plug-in HEVs and BEVs
- Grid/infrastructure and standardization support expansion of plug-in HEVs and BEVs



**Renewable Biofuels**

- Renewable fuel capacity expands in select markets
- Second generation biomass-based fuel production technology matures



**CNG and LPG**

- CNG expands in commercial fleets
- Availability increases with demand and production capacity

#### Far (2025+)



**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
- Greater contribution by second generation biomass-based fuels



**CNG and LPG**

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

### Electric Vehicles

**We plan to spend \$11 billion by 2022 to build a model lineup of 40 hybrid vehicles, including 16 fully electric models. As well as this, we’re aiming to develop a high-performance electric utility vehicle by 2020.**

#### Thinking Big About Electrified Vehicles

Leading in electrification, [autonomy and connectivity](#) is a vital component of our plan for the future. We have already committed a plan that includes an investment of \$11 billion to put 40 hybrid and fully electric vehicles on the road by 2022. 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 want to stay ahead of the curve in terms of electric innovation. Global demand for new, cleaner transportation is rising. China, India, France and the U.K. have all already announced plans to phase out vehicles powered solely by combustion engines and fossil fuels between 2030 and 2040. And we want to help them stay on track toward that goal.

Related Page:

- > [Our Plan for Reducing Vehicle Emissions](#)

In May 2018, we moved our electric vehicle and autonomous vehicle teams into a refurbished former factory in Detroit’s historic Corktown neighborhood. The new environment will accelerate our push into electrification and strengthen development of self-driving cars, while identifying and solving challenges for these vehicles in an urban environment.

We already have nearly two decades of experience in electrification – developing vehicles that run on a battery-powered electric motor or a combination of electric and gasoline powertrains, along with the supporting infrastructure. We are committed to significantly increasing investments in electric vehicles.

In March 2018, we announced an extension of our partnership with the Mahindra Group to co-develop a small electric vehicle and a number of SUVs. Using our expertise, global reach and connectivity technologies, the vehicles will build on Mahindra's existing portfolio of commercial electric vehicles.

In China, Ford is exploring a possible joint venture with Anhui Zotye Automobile Co. to produce an electric passenger vehicle, representing our commitment to new energy vehicles in the sector's fastest-growing market in the world.

*"We're all in on this and we're taking our mainstream vehicles, our most iconic vehicles, and we're electrifying them. If we want to be successful with electrification, we have to do it with vehicles that are already popular."*

**Bill Ford**  
Chairman, Ford Motor Company

### Hybrid Electric Vehicles (HEVs)



#### Power Sources

- Internal combustion engine (ICE), electric motor with a battery system



#### Benefits

- When using the electric motor and battery system only (e.g., low speeds, short distances), no gasoline is used
- Can run on battery power, on ICE power, or both
- Regenerative braking system captures energy to recharge the battery



#### Models

- Hybrid versions of high-volume product platforms, including: Ford C MAX, Ford Fusion, Ford Mondeo, Lincoln MKZ, Ford Police Responder Hybrid Sedan

### Plug-in Hybrid Electric Vehicles (PHEVs)



#### Power Sources

- Internal combustion engine (ICE), electric motor with a high-voltage electric battery



#### Benefits

- Battery can be charged from a household or public electric outlet
- When battery is depleted, vehicle functions as a standard HEV
- Accrues charge through regenerative braking
- Tailpipe emissions can reach zero when running on battery power



#### Models

- Fusion Energi, Ford C MAX Energi, Mondeo Energi, Police Special Service Plug-in Hybrid Sedan

### Battery Electric Vehicles (BEVs)



#### Power Sources

- High-voltage electric motor, powered by a lithium-ion battery pack



#### Benefits

- Lack of tailpipe CO<sub>2</sub> and other emissions during use



#### Models

- Focus Electric

## Case study

### Delivering More E-Vans for Deutsche Post DHL

We're partnering with Deutsche Post DHL Group to produce electric delivery vans (e-vans). In 2017, almost 150 e-vans – manufactured in Aachen, Germany – were used to support the group's urban parcel delivery service in Germany, and we plan to build 2,500 more by the end of 2018.

Our most recent model, the StreetScooter WORK XL, is based on our Ford Transit chassis fitted with a battery-electric drivetrain. Its battery has a range of up to 200 km, and an average charging time of just three hours. Each WORK XL could save around 5 metric tons of CO<sub>2</sub> emissions and 1,900 liters of diesel fuel annually. So when all 2,500 planned vehicles are in service, this could avoid 12,500 metric tons of CO<sub>2</sub> and save 4.75 million liters of fuel every year.

In addition to the WORK XL, more than 3,000 StreetScooter WORK and WORK L electric vehicles, plus about 10,500 pedelecs, are currently in service, making Deutsche Post DHL the largest e-fleet operator in Germany.

*"This joint project will be Europe's largest manufacturer of emission-free, medium-sized e-vans, and it doesn't come a moment too soon. Buses, cars and delivery vans play vital roles in our daily lives, but we have to find a way to make them cleaner. This project is a great step along this path."*

**Steven Armstrong**  
Group Vice President and President, Europe, Middle East & Africa, Ford Motor Company

## Vehicles Powered by Alternative Fuels

### Renewable Biofuel Vehicles



#### Fuel

- Ethanol**, currently made from fermented corn sugars or sugar cane, is usually blended with gasoline (e.g., E10 or E85); ethanol from non-food feedstocks is technically feasible
- Biodiesel**, made from soy, canola, rapeseed, corn or palm oil, or animal fats, and mixed with fossil diesel (e.g., B7, B20)



#### Benefits

- Biofuels made from renewable resources may reduce CO<sub>2</sub> emissions
- Next-generation biofuels made from plant cellulose use stems and leaves, reducing competition for food crops



#### Models

- E85 FFV: Focus, Escape, Explorer, Taurus, F-150, Transit Connect, Transit
- B20: F-150, F-250/F-350 Super Duty, Transit

### CNG and LPG Vehicles



#### Fuel

- Compressed natural gas (CNG)
- Liquefied petroleum gas (LPG)



#### Benefits

- Lower CO<sub>2</sub> and life cycle GHG emissions than gasoline or diesel vehicles
- Lower non-CO<sub>2</sub> emissions

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**Models**

- Wide range of commercial vehicles: F-150, F-250, F-350, Transit, Transit Connect, F-X50 cutaway, F-X50 chassis cab

**Hydrogen Fuel Cell Vehicles (FCVs)**



**Fuel**

- Hydrogen fuel cell system – converts stored hydrogen to electricity



**Benefits**

- Zero-emission electric-drive vehicles
- Only water and low-temperature heat are by-products

**CO<sub>2</sub> Savings vs. Gasoline (E10) in the U.S.**

| Powertrain/Fuel                | Tank-to-wheels <sup>5</sup><br>CO <sub>2</sub> emissions | Well-to-wheels <sup>6</sup><br>CO <sub>2</sub> emissions |
|--------------------------------|--|--|
| HEV                            | 28%  | 28%  |
| PHEV <sup>1,7</sup>            | 45%  | 37%  |
| BEV (grid-average electricity) | 100%   | 56%  |
| BEV (renewable electricity)    | 100%   | 100%   |
| E85 <sup>2</sup>               | 2%   | 27%  |
| CNG                            | 25%  | 19%  |
| LPG                            | 11%  | 13%  |
| FCV <sup>3</sup>               | 100%   | 41%  |
| Diesel                         | 15%  | 14%  |
| B7 (Europe) <sup>4</sup>       | 15%  | 17%  |
| B20 (U.S.) <sup>4</sup>        | 15%  | 24%  |

**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,<sup>8</sup> battery- and hydrogen-powered vehicles... it is during production of the fuel (electricity or hydrogen)

**What's Next in Alternative Fuels and Powertrains?**

Our PHEV Ford Transit Custom van is the centerpiece of a multimillion-dollar project to improve air quality in London and Valencia. A 12-month trial was launched last year in London, and the project is now being extended to the Spanish city of Valencia. Featuring a fleet of vans running solely on electric power, it will explore how PHEVs can contribute to cleaner air targets and enhanced productivity.

Related Page:

> [Data: Vehicle Fuel Economy and CO<sub>2</sub> Emissions](#)

Ford is a founding partner – along with BMW Group, Daimler AG, and Volkswagen Group with Audi and Porsche – of IONITY, a pan-European joint venture to develop the continent's most efficient fast-charging network for electric vehicles. Together, we plan to build 400 fast-charging stations in key European locations by 2020. Our aim is to make long-range travel easy for electric vehicles.

With respect to Hydrogen Fuel Cell Vehicles, Ford continues to research fuel cell technology with the goal of making the technology affordable and closing technical gaps associated with durability and operation in cold climates.

Related Pages:

> [Improving Fuel Economy](#)

> [Scaling Up Electrification](#)

1. Average grid electricity mix (GREET 2017).
2. Ethanol from corn.
3. Hydrogen from steam methane reforming of NG at central plant.
4. Biodiesel from rapeseed (RME).
5. [2015 US Vehicle efficiency from Elgowainy, A. et al. \(2016\) Argonne National Lab report number ANL/ESD-16/7.](#)
6. [Well-to-tank from GREET 2015.](#)
7. PHEV has c.20 km all-electric range.
8. Plug-in hybrids that travel long distances or use renewable electricity can incur more GHG emissions from vehicle use than fuel production.

**ADDRESSING NON-CO<sub>2</sub> EMISSIONS**

**We are working hard to reduce emissions of criteria and non-CO<sub>2</sub> pollutants in our research, product development and operations. We do this in accordance with vehicle emissions standards around the world, as they become increasingly stringent.**

Fuel-combusting vehicles release smog-forming vehicle criteria emissions that get trapped close to the ground and create a haze that can affect people's health. These emissions are the result of the incomplete combustion of fuels, impurities in fuels and the high-temperature oxidation of atmospheric nitrogen during the fuel combustion process. Criteria pollutants associated with smog include hydrocarbons, nitrogen oxides (NO<sub>x</sub>), carbon monoxide and particulate matter. In many areas of the developed world, air quality has improved in recent decades due to the implementation and enforcement of emissions standards for motor vehicles as well as for stationary sources.

We comply with criteria emission standards in all regions, including the new Tier 3/LEV III standards in the United States and the Real Driving Emissions standard in Europe.

Related Page:

> [Our Plan for Reducing Vehicle Emissions](#)

**Regional Criteria Emissions Standards**

**Salient Issue**

**Air Quality**

During our first formal human rights saliency assessment, we identified air quality as one of our nine most important issues – those at risk of the most severe negative impact through Ford's activities and business relationships.

Going forward, we're taking steps to develop action plans to manage and remediate these issues, and to expand our reporting on them.

> [Find out more about our human rights saliency assessment](#)



**United States**

✓ **Already Compliant or Surpassing**

- Environmental Protection Agency (EPA) Tier 2 regulations
  - California's Low Emission Vehicle II (LEV II) program
- **Becoming Compliant as Phased In**
- EPA Tier 3 standards
  - California's LEV III standards, closely aligned with the EPA's Tier 3 program



**Europe**

✓ **Already Compliant or Surpassing**

- Euro 6 tailpipe emissions standards Phase I
- **Becoming Compliant as Phased In**
- Euro 6 Phase II
  - Euro 6d Real Driving Emissions (RDE) standards
  - Worldwide Harmonized Light

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**China**

➔ **Becoming Compliant as Phased In**

- National stage-6 emission standards



**Other Regions**

✔ **Already Compliant or Surpassing**

- **India:** Current regulations based on Euro 4 and Euro 5 standards
- **Brazil and Argentina:** Standards based on Euro 5
- **Middle East:** Standards based on Euro 2, Euro 3 diesel, and Euro 4

➔ **Becoming Compliant as Phased In**

- India's Bharat Stage VI (BS VI) standards

**Beyond the Tailpipe**

With the decrease in vehicle tailpipe emissions, other emissions are assuming a greater proportional importance. Through our Restricted Substance Management Standard, we have:

- Prohibited GHGs such as perfluorocarbons (PFCs) and sulfur hexafluoride (SF6)
- Replaced all chlorofluorocarbon (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-CO<sub>2</sub> GHG emissions. For example, in the U.S., we have replaced HFC-134a with HFC-1234yf – a compound with a lower global warming potential – in many passenger cars across our portfolio. 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-CO<sub>2</sub> emissions.

We are exploring current and likely future particulate matter emissions associated with brake and tire wear and from different vehicle technologies. We have completed an initial analysis and will discuss our findings in a future report.

Related Page:

> [Data: Non CO<sub>2</sub> Tailpipe Emissions](#)

**USING SUSTAINABLE MATERIALS**

**The materials used in a vehicle is a key aspect of its sustainability, across all life cycle stages. We aspire to use materials with equivalent or superior performance but that have a smaller environmental footprint. This includes lower greenhouse gas (GHG) emissions and energy use, less waste and a move away from plastics made from fossil fuels.**

**HOW WE'RE DRIVING CHANGE**

**Creating New and Smarter Materials**

Guided by our global materials strategy, we continue to be a leader in the research, development and integration of more plant-based, renewable and recycled content in our vehicles.

We aspire to use materials that have been obtained by sustainable means, with lower social and environmental impacts, and equivalent or superior performance to existing materials. Our ongoing research on closed-loop recycling and second-life use of components is supplemented by partnerships with other industries and the farming community to utilize their by-products.

Taking a holistic view of the materials used in our vehicles, the aspects we consider include its origin (whether virgin, renewable or recycled), the methods used to source and process it, the emissions generated throughout its life cycle, any health impacts associated with its use, and how it is disposed of at the end of its useful life.

Today, we're proud to be exploring new materials using everything from tree cellulose to tomato skin and dandelion roots. We are also striving to use fewer materials and encouraging local sources to reduce their carbon footprint.

**What's in a Typical Vehicle?**

Up to **40,000** parts... **1,000** different materials... **10,000** chemical substances...



**The Sustainable Materials in Our Vehicles**

Renewable and recycled: we're developing a set of sustainable materials from resources as diverse as soybeans grown on the farm and post-consumer plastic bottles. Scroll to see all the different materials we are using.

**RECYCLED AND RECYCLABLE MATERIALS**



**Recycled Rubber**

Made with material from post-consumer tires, recycled rubber is used in underbody covers in a range of Ford vehicles.



**Recycled Aluminum**

Made in the closed-loop recycling systems at some Ford factories, recycled and recyclable aluminum goes into the body frames of four series of North American Ford trucks.



**Recycled Plastic Bottles**

Diverted from landfill and processed at Ford factories, recycled plastic bottles are used to make floor carpeting and wheel liners in the Ford Transit and C-Max vehicles, as well as the REPREEVE fabric used in the F-150.



**Recycled Cotton**

Made with the scrap cuttings from the making of T-shirts and denim jeans, the interior padding and sound insulation in most Ford vehicles contain recycled cotton.



**Post-Industrial and Post-Consumer Recycled Materials**

Maintaining appearance as well as performance, post-industrial and post-consumer recycled PET from water and soda bottles can be found in seat fabrics in 12 Ford vehicles. These materials would otherwise be slated for landfill.

**BIO-BASED RENEWABLE MATERIALS**



**Nylon**

Castor bean oil is used for the nylon fuel lines for most vehicles, and instrument panel soft touch foams on three vehicle lines. Post-consumer nylon carpeting is used in cylinder head covers on the Ford Escape, Fusion, Mustang and F-150.

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**Soy**

Soy-based polyurethane foam is used in seat backs, cushions and head restraints in every North American-built Ford vehicle, while exterior mirror gaskets incorporate both recycled tires and soybean oil.



**Rice Hulls**

Rice hulls, a by-product of U.S.-grown rice grain, are used to reinforce plastic in the Ford F-150's electrical harnesses.



**Coconut Fibers**

Fibers taken from coconut husks reinforce the plastic trunk liners of a number of Ford vehicles.



**Cellulose-Reinforced Plastic**

Using fibers from sustainably grown trees, cellulose-reinforced plastic has been used to replace fiberglass in the armrests of the Lincoln MKX.



**Wheat Straw-Reinforced Plastic**

Wheat straw, a waste by-product of wheat, is used to reinforce the plastic in the Ford Flex's storage bins.



**Kenaf/Hibiscus**

Molded plastic door parts in the Ford Escape incorporate kenaf, a species of hibiscus and a close relative to hemp

**OUR PERFORMANCE**

**Materials with Lower Life Cycle Impacts**

We are using more recycled, renewable and recyclable materials, and working to eliminate substances of concern.

- **300** of our vehicle parts are derived from renewable materials
- **37,000** new F-Series truck bodies' worth of high-grade aluminum scraps are recycled every month
- **228 million pounds** of CO<sub>2</sub> has been saved from entering the atmosphere since we started using soybean-based foam
- **Raw Materials Observatory** launched by the Drive Sustainability partnership, a group of 10 global auto manufacturers including Ford

**RECYCLED MATERIALS**

**Using materials with recycled content diverts consumer and industrial waste from landfill, reduces the depletion of valuable natural resources, and can reduce both energy consumption and costs. However, they must deliver the same quality, appearance and performance as virgin materials.**

**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." The aluminum scraps from the stamping of window openings are turned into body panels that can comprise 40 percent of the original metal used.

Related Page:

> [What's in a Vehicle?](#)

To achieve the level of purity required for auto bodies, we have invested \$60 million in equipment at three of our U.S. plants. This enables us to recycle 5 million pounds of high-strength, military-grade aluminum scrap every week. That's enough to build more than 37,000 new F-Series truck bodies a month.

**All of our vehicles contain a minimum of 25 percent post-industrial PET content, as well as recycled post-consumer carpeting.**

**What's Next?**

Looking further ahead, we are exploring other waste streams, including shredded banknotes and recycled ocean plastics. An estimated 14 million pounds of plastic are dumped into our oceans every year. We've been finding uses for this mixed plastic stream in some of our fabrics, which will be critical to helping the planet and ocean wildlife.

We are also:

- Transforming post-consumer HDPE laundry detergent containers and milk bottles into blow-molded automotive components, including some HDPE ducts that were made from detergent bottles in the aftermath of 2017's Hurricane Harvey in Houston
- Exploring how post-consumer drinks bottles can be used to make energy-absorbent materials
- Working in a non-competitive environment to explore using industrial waste products in our production

Related Page:

> [Waste Reduction](#)

**RENEWABLE MATERIALS**

**We continue to use durable, plant-based materials because they provide many environmental, economic and performance benefits. These include lower greenhouse gas (GHG) emissions; vehicle weight reduction and improved fuel economy; reduced manufacturing energy use; and a reduced dependence on petroleum-based plastics. They also help divert waste from landfill and generate new revenue opportunities for the agricultural sector.**

**Soy Was Just the Start**

Around 8 percent of all petroleum oil goes into plastic and, once used, half of that is dumped into landfills; the rest often ends up in our oceans or is burned. Relatively little is recycled.

Our research scientists in the U.S., Germany, China and Brazil have been exploring ways to replace petroleum-based plastics with more sustainable materials since 2000. It's been over a decade since Ford first used soybean-based foam, and since 2011 it's been a key material in the seat cushions, seat backs and headrests of every vehicle we build in North America. To date, after more than 18.5 million vehicles and half a trillion soybeans, we've saved more than 228 million pounds of CO<sub>2</sub> from entering the atmosphere – that's the equivalent carbon footprint of 4 million trees in a year.

We've also been researching cellulose from trees in its nano form, and have found some very interesting properties. When added to plastics, nanocrystalline cellulose produces excellent sound damping. In foams, it's found to significantly increase the mechanical properties of the material. We look forward to using these findings in our products soon.

**Using the Whole Farm**

Our renewable materials program has expanded to include a wide range of foams, plastics and composites derived from renewable resources (see our [What's in a Vehicle? graphic](#)). We currently feature eight sustainable materials in our production vehicles: soy, wheat, rice, castor, kenaf (hibiscus), tree cellulose, jute and coconut. And as we continue to experiment, the list of renewable resources we are researching reads like an entire farm – tomato skin, bamboo ([a remarkably versatile material](#)), agave fiber (working with Jose Cuervo® in Mexico), dandelion roots and even algae. We're also exploring innovative uses of carbon itself and are first in the industry to develop foams and plastics using captured CO<sub>2</sub>.

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Around 300 vehicle parts are derived from renewable materials, many of which were pioneered by Ford. These materials reduce the weight of vehicle parts such as seat cushions, storage bins and door panels, meet all of our strict durability and performance requirements; and provide agricultural suppliers with new revenue streams.

**More than 30,000 soybeans are typically used in a Ford vehicle for seat backs and cushions.**

## Case study

### Bamboo: The Next Carbon Fiber?

It can grow a meter in a day, it's compostable and has the tensile strength of steel. And in recent years, we've been working with suppliers to evaluate the viability of using bamboo in vehicle interiors. Some surfaces inside our vehicles could be made from a combination of bamboo and plastic, making them particularly strong.

Our team at the Nanjing Research and Engineering Centre has found that bamboo performs better than many other synthetic and natural fibers across a range of materials tests. It has also been heated to more than 212 degrees Fahrenheit to ensure it can maintain its integrity.

The benefits of bamboo have long been recognized, from its tensile strength – known to rival or even better some types of metal – to its speed of growth, reaching maturity in two to five years.

*“Bamboo is amazing. It's strong, flexible, totally renewable, and plentiful in China and many other parts of Asia.”*

**Janet Yin**

Materials Engineering Supervisor, Nanjing Research & Engineering Centre, Ford Motor Company

### Our Research Partnerships

We continue to research renewable materials and their potential applications at our research centers around the world, and through partnerships with both suppliers and non-automotive partners.

For example, 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 demonstration Focus battery electric vehicle (BEV)
- Partnering with Procter & Gamble to use biomimicry, inspired by nature's solutions, to solve some of the most challenging material issues facing our industries

As part of WWF's [Bioplastic Feedstock Alliance \(BFA\)](#), we are working to support the responsible development of plastics made from plant material. And we were excited about recent laboratory success in generating polyurethane foams that meet general durability and performance requirements, which utilize CO<sub>2</sub> as a feedstock.

A key question posed by the growing demand for electrified vehicles is whether there is enough lithium to meet the future demand for electric vehicle traction batteries. Working with researchers from the University of Michigan, we addressed this issue by first compiling data on global lithium-containing deposits and then comparing the world's lithium resources with the range of likely future lithium demand this century for non-battery usages, portable electronics and electric vehicle batteries. We concluded that global lithium resources can support even a rapid and widespread demand for electric vehicles until at least the end of this century.

Related Page:

> [Waste Reduction](#)

## ELIMINATING SUBSTANCES OF CONCERN

**We use a range of systems to monitor and manage the materials we use in our vehicles. These help us ensure our products meet all relevant local and global regulations, and phase out substances of concern where economically and technically feasible.**

### Phasing Out Restricted Substances

We were one of the first automotive companies to start eliminating a number of chemicals<sup>1</sup> being monitored by governments around the world, including the EU, U.S., Canada, Japan and China.

We have a phase-out requirement for all EU REACH-restricted substances that have reached or are approaching their sunset dates – the dates after which a substance of concern cannot be used in the EU without authorization from the European Chemicals Agency (ECHA).

We also advise relevant governmental agencies about ongoing developments in global substance restrictions such as the [Stockholm Convention](#).

We have made notable progress in:

- Phasing out **hex chrome** (hexavalent chromium), a potential carcinogenic corrosion coating used on nuts, bolts and brackets
- Replacing **lead** wheel weights throughout our global operations with steel alternatives
- Eliminating **mercury** from all components
- Offering brake pads that contain less **copper**, because copper degrades on use and can end up in the water cycle through urban drainage systems

### Driving Collective Action

Taking a strong role in our efforts to eliminate less desirable chemicals, we lead or chair several industrial association working groups, including:

- 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 (EU car manufacturer association) working group on Materials and Substances

### Rare Earth Elements

Small quantities of the 17 so-called “rare earth elements” (REEs) are used in internal combustion engines, while neodymium and dysprosium are used in magnets in motors and generators. Cerium is used in vehicle exhaust control systems, and small amounts of other REEs are used in a variety of vehicle components. Our hybrid electric, plug-in hybrid and battery electric vehicles (HEVs, PHEVs and BEVs) also contain REEs.

REEs are hard to extract, both economically and sustainably, and we're actively engaged in reducing their use, particularly in our electric vehicles.

Related Page:

> [Responsible Sourcing of Raw Materials](#)

### Promoting Occupant Health

#### Air Quality

- Due to environmental factors (moisture, temperature, etc.), vibration or abrasion, nanoscale materials may pose risks to human health and the environment – not just through exposure during manufacturing and processing but across their entire life cycle
- Our guidelines direct safe and responsible research involving nanotechnology, and require environmental considerations to be incorporated into our technical innovations and product development
- We have specifications for the air quality in our vehicles

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## Allergens

- Our engineers test the materials that come into direct contact with passengers for any allergen impacts
- Many of our vehicles also feature high-performance filters that keep out allergenic pollens
- The Allergy Alert® app enables drivers to check pollen levels and other health-risk conditions with simple voice commands

## In-Car Health and Wellness

- We are exploring how wearable devices, including smart watches and fitness bands, can be used to assess driver stress by measuring heart rate, perspiration and skin temperature
- Working with medical companies and auto insurers, we're exploring whether monitoring driver wellness could reduce insurance premiums
- We are collaborating with the Henry Ford Health System on a health and wellness app challenge
- Partnerships with the University of California Berkeley, Peking University and Tsinghua University are seeking to better understand the sources of emissions near roads and how to quantify them

Related Page:

> [Reducing End-of-Life Impacts](#)

## Monitoring and Managing Materials

- **Restricted Substance Management Standard (RSMS):** The RSMS designates the substances to be restricted or eliminated from our operations and vehicles
- **International Material Data System (IMDS):** This web-based tool, sponsored by around 40 original equipment manufacturers (OEMs), is used by more than 100,000 automotive supplier companies to track, review and report the materials and substances in vehicle components
- **Global Materials Management (GMM):** Our materials and substances tracking and reporting tool
- **Global Material Approval Process (GMAP):** System for reviewing and approving the production and non-production materials used in our plants and facilities
- **Materials and Toxicology System (MATS):** Our internal database for managing specifications, Material Safety Data Sheets and Approved Source List, and for generating compliance reports

## REDUCING END-OF-LIFE IMPACTS

**Automobiles are some of the most highly recycled consumer products in the world. Most of the materials they contain can be recovered at the end of their useful lives.**

In theory, end-of-life vehicles are at least 95 percent recoverable, but the cost in energy and labor to recover the final fractions toward 100 percent can be extensive. Nonetheless, we try to achieve the highest level of economically and environmentally viable recovery through the careful selection of materials, and by sharing information about the materials our vehicles contain with dismantlers.

## Take-Back Schemes

Across Europe, Ford offers car owners a cost-free take-back network with take-back points that are able to fulfill Ford's waste-quality standards. The recycling network is set by each European market and licensed by the appropriate national environment agency.

As part of this process, Ford's Environmental Quality Office and End-of-Life teams perform a structured duty-of-care audit process, visiting take-back points to ensure our vehicles are treated responsibly at

the end of their useful life, and keeping the latest end-of-life network information available on Ford National EU web portals.

Related Page:

> [Our Dealers](#)

## Alternative End-of-Life Treatments

None of our current components contain mercury but to address end-of-life issues associated with mercury in older vehicles, we were instrumental in getting the U.S. Environmental Protection Agency to work with state authorities, dismantlers, steelmakers and environmental groups to recycle mercury switches. With more than 10,000 participants in the scheme, 7 metric tons of mercury were recovered by the end of 2017.

We also support treatment technologies that make the recycling of end-of-life vehicles more economically and ecologically viable, and co-sponsored a life cycle assessment that showed the environmental benefits of diverting plastic, foam and other nonmetallic materials from landfill and using it 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 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 belong.

Related Page:

> [Waste Reduction](#)

## PRODUCT QUALITY AND CUSTOMER SATISFACTION

**Our customers expect high-quality products and exceptional experiences. We strive to understand what they are seeking, and continuously improve the quality of our vehicles to meet their needs and expectations, time after time.**

### HOW WE'RE DRIVING CHANGE

## Managing Product Development

Quality is at the heart of everything we do, and it drives ongoing improvements across all functions while delivering high-quality vehicles that our customers want and value.

We use our global Quality Operating System to ensure that our vehicles meet or exceed competitive and performance targets, as well as customer expectations, at every stage of their development and manufacture.

And once a vehicle concept is finalized and approved, it is brought to market using our Global Product Development System. This combines the best production methods from across our global operations, and provides common efficiency and quality metrics.

## Monitoring Quality and Satisfaction

We use a combination of internal and external measurements to assess how we are doing and where we can improve product quality. Our primary source of information, the Global Quality Research System, tracks customer satisfaction and "Things Gone Wrong" (TGW). It is conducted throughout the year by the consulting firm Ipsos RDA Group.

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We track warranty claims and costs internally, and also subscribe to J.D. Power and Associates' annual Initial Quality Study, Vehicle Dependability Study, and Automotive Performance, Execution and Layout (APEAL) Study.

## ENHANCING THE USER EXPERIENCE

**At Ford, product development always starts with the customer. We look to understand 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.**

### Focused on the Customer

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 all over the world. We then use human-centered design to help us create insights and develop new experiences that meet their needs and exceed their expectations.

Our culture of collaboration and continuous improvement means that we can address satisfaction concerns quickly and effectively, and learn from every quality issue.

Related Page:

> [Data: Product Quality and Customer Satisfaction](#)

### Making Self-Driving Technology Work for People

We recently started a series of experimental pilots in different cities to help us understand how autonomous vehicles can contribute to people's daily mobility needs, and what the human element is in a future of automated technology.

Most recently, we tested [autonomous delivery services in Miami](#) for their ability to provide desirable and compelling user experiences.

We're also working closely with Postmates and Dominos on a self-driving delivery vehicle in both Ann Arbor, Michigan and Miami. Our goal is to optimize goods delivery services while staying attuned to the diverse needs of people in contexts like urban centers. While it's important to streamline the process of delivery, we find people are really passionate about defining how new technologies will shape our world. And that's what excites us.

With a hyper-collaborative start-up style working model, the Ford-Postmates-Dominos team first envisioned future scenarios and then prototyped experimental vehicles based on core user needs and design-thinking methodologies. Joint teams of researchers, designers and techies then set out to really engage everyday people in making the experience both fun and easy.

Those who opted into the testing could track the delivery vehicle as it headed out with their order, and they received text updates, instructions on what to do and a notification when their order had arrived. At the test vehicle, they used an intuitive keypad to open the container and take their order. Using voice technology, compelling user interfaces and some design intuition, the resulting experience has shown to be delightful to the user and has taught us about the human experience of living among future technologies.

Related Page:

> [Product Quality and Customer Satisfaction](#)

## 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 the information they share responsibly.**

## Responsible Data Practices

Customers, employees and others care about the privacy and security of their data, and we take our responsibilities seriously. We commit to protect customers' privacy and handle their data securely and responsibly as we explore new ways to deliver innovative solutions.

Our companywide governance infrastructure drives a holistic approach to the privacy and security of the data that has been entrusted to us. This includes [policies and directives](#) that give confidence to those who share their personal information with us. These policies require transparency, responsible data handling and use, and choice where appropriate.

Related Page:

> [Ethics and Compliance](#)

We are also a founding member of the [Auto-ISAC](#) (Information Sharing and Analysis Center). Established by the 12 members of the Auto Alliance, Auto-ISAC gathers, analyzes and shares information designed to combat cyber-related threats and address vulnerabilities.

## Harnessing the Power and Potential of Data

Investing in data science and analytics allows us to harness the potential of technology to deliver great products and services, especially through our emerging businesses of mobility, connectivity and autonomous vehicles.

A prime example is the Transportation Mobility Cloud, a new open platform designed to connect and coordinate smart transportation services. A fully integrated system will require the large-scale connection of data from a variety of sources, including public transport services, self-driving cars, cyclists and even traffic lights and parking locations. The Cloud, which we're building with new acquisition Autonomic, will process this data in real time, enabling a range of apps and services for vehicle connectivity, location-based services and route mapping.

Related Page:

> [Building the City of Tomorrow](#)

## OUR DEALERS

**Our dealers are the public face of Ford. They provide employment, tax support, leadership and customer service in our communities, and play a vital role in our success.**

### Our Dealer Network

At the end of 2017, we had 11,428 Ford and Lincoln dealerships around the world. We collaborate with our U.S. dealers through the Ford Trustmark Facility Assistance Program to create loyal advocates of our products and services, and work closely with our Lincoln dealers to improve the retail experience.

[Diversity and inclusiveness](#) are a part of our DNA. We work hard to encourage a strong minority presence, with many female- and minority-owned dealerships.

We develop our dealers through education and training, provide capital loans to minority dealers, and support them through our Ford Minority Dealers Association (Ford MDA) and the National Association of Minority Automobile Dealers.

### Dialogue With Dealerships

Through our Ford and Lincoln Dealer Councils, 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.

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Dealer satisfaction is measured through the [National Automobile Dealers Association \(NADA\)](#) biannual survey.

### Our Salute to Dealers

Ford dealers do a lot more than sell cars: they go above and beyond to better their communities across the world, and through their commitment and hard work they enhance our brand. Our 18th annual Salute to Dealers award aims to recognize those dealers who did all they could to make a positive difference to those around them.

In 2017, Ford and Lincoln dealers contributed more than \$110 million and 50,000 hours to charitable causes and nonprofits. Of that, 17 percent went to firefighters and other first responders, 13 percent went to children's charities, another 13 percent went to educational programs and 10 percent went to veterans' causes.

We selected six winners from a field of more than 60 nominees, and donated \$10,000 each to a charity of their choice:

- **Charlie Diers**, Diers Ford Lincoln, Fremont, Nebraska, U.S.
- **Dan Hay**, Jim Burke Ford, Bakersfield, California, U.S.
- **Don Jenkins**, Jenkins and Wynne Ford Lincoln, Clarksville, Tennessee, U.S.
- **Siegfried Ernst**, Ernst+König GmbH, Freiburg im Breisgau, Baden-Württemberg, Germany
- **Al MacPhee**, MacPhee Ford, Dartmouth, Nova Scotia, Canada
- **Ivo Luiz Roveda**, Ford Center, Curitiba, Brazil

> [Learn about our winners' good work.](#)

Related Pages:

- > [Our Contribution to Society](#)
- > [Supplier Diversity](#)

## IMPROVING VEHICLE SAFETY

**Safety continues to be one of the highest priorities in the design of our vehicles, and quality is a critical aspect of customer safety – and therefore of our responsibilities and success as a company.**

### HOW WE'RE DRIVING CHANGE

#### Prioritizing Safety

We view automotive safety holistically; it encompasses all aspects of our business, from vehicle design and manufacturing to operator behavior and road infrastructure.

Our corporate safety policy, Policy Letter 7, outlines our commitment to designing and manufacturing vehicles that achieve high levels of safety over a wide range of real-world conditions. This helps us meet or exceed both applicable laws and regulations, and the needs and expectations of our customers.

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.

### Salient Issue

#### Product Safety and Quality

During our first formal human rights saliency assessment, we identified product safety and quality as one of our nine most important issues – those at risk of the most severe negative impact through Ford's activities and business relationships.

Going forward, we're taking steps to develop action plans to manage and remediate these issues, and to expand our reporting on them.

> [Find out more about our human rights saliency assessment](#)

### OUR PERFORMANCE

#### Keeping Safety Our Top Priority

We are committed to building safe vehicles with additional driver assist technologies, and encouraging safer behavior behind the wheel through training and education programs.

- **60%** of Ford and Lincoln nameplates in the United States have a U.S. NCAP 5-star overall safety rating<sup>1</sup>
- **69%** of Ford and Lincoln nameplates in Europe have a Euro NCAP 5-star overall safety rating<sup>2</sup>
- **36%** of Ford and Lincoln nameplates in China have a China NCAP 5-star overall safety rating<sup>3</sup>
- **40,000 young and new drivers across 41 countries** participated in our Ford Driving Skills for Life program in 2017

1. As of June 2018

2. As of June 2018

3. As of June 2018

## VEHICLE SAFETY PERFORMANCE

**Ford continues to receive high marks and accolades for vehicle safety in a number of the industry's key public and private crash-testing programs.**

We conduct engineering analyses, computer simulations, and component, sub-system and full-vehicle crash tests to evaluate the performance of our vehicles and components at a number of sites in the United States and Europe:

#### Crash-Test Facilities

##### Function

Observe and evaluate the performance of our vehicles' and systems' crash testing.

##### Locations

- Dearborn, Michigan
- Merkenich, Germany
- Dunton, U.K.

#### Motion-Based Driving Simulator VIRTTEX (Virtual Test Track Experiment)

##### Function

Research human behavior with advanced driver assist features, human-machine interfaces, and factors such as drowsy or distracted driving.

##### Locations

- Dearborn, Michigan

#### Research and Innovation Centers

##### Function

Explore and develop new and advanced technologies in the areas of passive safety, driver assistance, connectivity, mobility and autonomous vehicles.

##### Locations

- Dearborn, Michigan
- Palo Alto, California
- Aachen, Germany

#### Global Safety Ratings

Public Domain programs for rating vehicle safety performance vary around the world. They are performed by a range of consumer advocacy groups, organizations such as New Car Assessment Programs (NCAPs), auto clubs, motoring magazines and insurance-sponsored organizations. Each has its own testing protocols and/or evaluation criteria.

Related Page:

> [Data: Vehicle Safety](#)

Because of the different assessment schemes and the fact that NCAPs around the world are continually being updated, it is increasingly difficult to consistently achieve the highest ratings across all regions. This is a dilemma for global automotive companies like Ford because a particular star rating in one region's NCAP does not necessarily mean that the vehicle will have the same rating if tested in a different NCAP.

Follow the links below for our latest ratings data:

### Global Safety Public Domain Organizations

|                           |  |
|---------------------------|--|
| Global                    | <a href="#">Global NCAP</a>              |
| North America             | <a href="#">IIHS</a>                     |
| North America             | <a href="#">U.S. NCAP (NHTSA)</a>        |
| Latin and South America   | <a href="#">Latin NCAP</a>               |
| Europe                    | <a href="#">Euro NCAP</a>                |
| Russia                    | ARCAP (website not available in English) |
| China                     | CNACP (website not available in English) |
| Japan                     | <a href="#">JNCAP</a>                    |
| Korea                     | <a href="#">KNCAP</a>                    |
| South East Asia           | <a href="#">ASEAN NCAP</a>               |
| Australia and New Zealand | <a href="#">ANCAP</a>                    |
| India                     | BNVSAP (program still under development) |

### Our Vehicle Safety Highlights

#### U.S. NCAP

- For 2018 model year (as at June 2018), 10 Ford and four Lincoln nameplates have been rated with 5-Star Overall Vehicle Scores

#### Euro NCAP

- The all-new Ford Fiesta has been awarded a 5-star safety rating by Euro NCAP, meaning that 11 Ford models now have valid 5-star ratings
- Through 2017, Ford received seven Euro NCAP Advanced Awards for innovative technologies, more than any other original equipment manufacturer (OEM)
- Through 2017, Ford received five Best in Class awards from Euro NCAP
- Currently, Ford has the most (11) valid Euro NCAP 5-star ratings of all brands

#### C-NCAP

- As of June 2018, four Ford and one Lincoln nameplates have achieved a 5-star overall rating

We are also working on vehicles that communicate with each other and with the world around them, and share findings with colleagues who are working toward our vision of an [integrated transportation ecosystem](#).

Related Pages:

> [Product Quality and Customer Satisfaction](#)

> [Driver Assist Technologies](#)

## DRIVER ASSIST TECHNOLOGIES

Sixty years after we set the standard with factory-installed safety belts, we still push the boundaries of safety innovation. We continue to develop new, innovative technologies to enhance vehicle safety and help customers stay safe on the road.

## A World of Driver Assist Options

We have made a wide variety of driver assist technologies available to customers, to help them drive more safely, to alert them to a potential collision and to make routine tasks easier. Many of these driver assist features and semi-autonomous technologies use radar, sonar and cameras to sense and interpret the environment. We are now in the process of democratizing these technologies by offering them to our customers as standard equipment.

Ford Co-Pilot360 is the most advanced suite of standard driver assist technologies. It includes automatic emergency braking with pedestrian detection, blind spot monitor, a lane-keeping system, rear backup camera and auto high-beam lighting. No non-luxury competitor offers this as standard in North America.

Standard automatic emergency braking – called pre-collision assist with pedestrian detection – can help drivers avoid collisions with other vehicles or pedestrians who might accidentally cross in front of the vehicle's path. If a potential collision is detected, a warning flashes and an alert sounds, and if the driver's response is not sufficient, the system can automatically apply the brakes to help minimize a frontal collision. The technology addresses Ford research showing a growing trend of people worrying about hitting pedestrians, and will be standard on 91 percent of Ford vehicles in North America by 2020.

The blind spot information system, or BLIS, uses radar to identify a vehicle entering the blind spot and alerts the driver with an indicator light in the side-view mirror. Cross-traffic alert can warn drivers of traffic behind when slowly backing out of a parking spot or driveway.

The lane-keeping system has three functions. First, it can notify drivers through steering wheel vibration that they need to correct course when the system detects the vehicle drifting close to lane markings. Second, it provides steering torque to steer back toward the center of the lane. Third, a driver alert system continuously monitors driving patterns using a forward-looking camera and provides visual and audio warnings when the system estimates the driver's vigilance level to be less than that of an attentive driver.

Related Page:

> [Data: Vehicle Safety](#)

## Our Latest Features

- Ford Co-Pilot360** will roll out in key global markets starting this fall to help customers drive more safely and confidently amid rising congestion and distractions
- In North America, **automatic emergency braking** will be standard on new passenger cars, SUVs and trucks up to F-150 going forward. Ford is also offering premium driver assist technologies, including adaptive cruise control with stop and go and lane centering, evasive steering assist and post-collision braking in North America
- Adaptive cruise control with Stop and Go** can maintain a set speed similar to regular cruise control, bring the vehicle to a complete stop when traffic slows and accelerate back to the preset speed when the traffic clears. Lane centering operates with adaptive cruise control Stop and Go and helps keep the vehicle centered in the lane by detecting the lane markings, using a forward-facing camera
- Evasive steering assist** can help drivers avoid a collision with a slower or stopped vehicle by providing appropriate steering support when the collision cannot be avoided by braking alone. The driver needs to initiate the steering maneuver for the avoidance, since the feature does not control steering
- Post-collision braking** applies the brakes following an impact to reduce the movement of the vehicle, mitigating the potential for secondary impacts with other traffic
- In 2019, Ford is introducing **reverse brake assist** with automatic emergency braking to help prevent drivers from hitting an object while backing up

- Our **2019 Ford Focus will have several Ford firsts** (in addition to other driver assist technologies): Post Collision Breaking, Pedestrian and Cyclist Detection, Cross Traffic Alert with Active Breaking, Evasive Steering Assist, and Adaptive Cruise Control with Lane Centering Assist

## The Foundations of an Autonomous Future

As well as improving safety today, our driver assist technologies are the building blocks for our vision of tomorrow, with autonomous vehicles operating in a fully connected transport ecosystem.

We are currently testing fully autonomous vehicles in real-world conditions, as well as implementing key semi-autonomous technologies across our entire portfolio. As outlined below, we are also conducting research with a number of public, private and academic partners to progress toward a future in which autonomous, connected vehicles communicate with one another, and with the road infrastructure, to help avoid collisions and reduce congestion.

Related Page:

> [Smart Vehicles for a Smart World](#)

## Our Safety Research Partnerships

### Technical Challenges Surrounding Automated Driving

- Evaluating how autonomous vehicle (AV) technologies may affect real-world crash scenarios with the University of Michigan
- Working with Purdue University to assess occupant use and sensing technologies
- Projects with Virginia Tech to evaluate how driver assist features will affect the safety of the occupant in accident scenarios, and to assess positional issues for potential restraints and seating configurations in AVs
- One of 28 partners in Automated Driving Applications and Technologies (AdaptIVe), Europe's largest research project on automated driving, which finalized in June 2017. A series of other projects in this area has been established
- Participant in the Society of Automotive Engineers Automated Driving Systems (ADS) Crashworthiness Task Force Committee

### Vehicle-to-Vehicle Safety Communication Systems

- Co-leading a group of eight automakers through the Crash Avoidance Metrics Partnership (CAMP) Vehicle Safety Communications 3 (VSC3) Consortium

### 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
- Maintaining the industry lead for cyber security activities at the United Nations level

### Driver Distraction

- Through partnerships with universities and organizations such as the Auto Alliance, we invest a significant amount of time and resources researching driver distraction and analyzing data from large-scale naturalistic driving studies

## OCCUPANT PROTECTION

**Our advancements in vehicle safety involves the research and development of technologies that protect drivers, passengers and other road users in a variety of situations.**

### Safety Belts and Airbags

Many factors influence a [vehicle's crash performance](#) including its ability to absorb energy on impact and the use of safety equipment such as safety belts and airbags. We offer various occupant protection technologies, such as:

- Dual-stage front airbags that adjust deployment based on the severity of the crash; load-limiting safety belts to reduce force on an occupant's chest; pyrotechnic safety-belt pretensioners that tighten the belts in the event of crash; side airbags and curtains for side impact crashes; and Safety Canopy side curtains that deploy in both side impacts and rollover crashes
- Patented technologies for airbags in other locations inside the vehicle, such as knee airbags for front passengers
- Use of advanced and ultra-high-strength steels, aluminum, plastics and composites in vehicle structures to work in concert with occupant protection technologies to manage the energy imparted to occupants in a crash

Related Page:

> [Data: Vehicle Safety](#)

### Precompetitive Projects and Partnerships

We collaborate with other automakers to enhance the safety of vehicle occupants, and often publish the results in peer-reviewed journals and scientific publications. We work alongside General Motors and Fiat Chrysler through the various working groups and committees of the U.S. Council for Automotive Research (USCAR), and join forces with other manufacturers through the Alliance of Automobile Manufacturers (Auto Alliance), the European Automobile Manufacturers Association (ACEA), the Society of Automotive Engineers (SAE) International, and the International Organization for Standardization (ISO).

### Research into Occupant Protection

We have teamed up with universities in many areas through our Alliance partner universities<sup>1</sup> to conduct vehicle safety and occupant protection research.

- 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
- Working with industry to evaluate the biofidelity, repeatability, reproducibility and durability of next-generation anthropomorphic test devices (ATDs) – including a small-size female and two mid-size male 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
- With USCAR, we conducted a literature research and meta-analysis project on crash avoidance technologies, including but not limited to advanced driver assist technologies such as AEB, lane departure, night vision and advanced lighting

- Along with USCAR, we have continued the collaboration with Sandia National Laboratories and the National Renewable Energy Laboratory to conduct research and crash testing of live lithium-ion batteries to evaluate their safety performance
- With Michigan State University, researching nano-liquid foam technology and its potential future applications in both restraints and structural applications
- With Wayne State University, researching methods to estimate a driver's age and gender
- With the Massachusetts Institute of Technology, evaluating the material properties of 3-dimensional metal lattices, produced by additive manufacturing, and developing the modeling methodology for crash-loading
- With the University of Michigan, researching methods to reduce the reaction time of electro-active polymeric materials for adaptive safety structural applications
- With SUNY, we're developing a topology methodology optimizing the cellular mesostructure's nonlinear behaviors for safety applications
- We are developing new state-of-the-art computer-aided engineering (CAE), using Iso-Geometric Analysis (IGA), and safety methods for process improvements, enhancement of computer simulation capabilities and to support virtual testing
- We have created a so-called "pre-crash matrix" based on real-world data to help us better understand and subsequently develop and validate active safety technologies

Related Page:

> [Driver Assist Technologies](#)

## POST-CRASH RESPONSE

**In-vehicle technology that helps occupants to call for assistance after an accident can give first responders potentially life-saving information, quickly and efficiently.**

### SYNC 911: Alerting Emergency Responders

Our SYNC® in-car connectivity technology, which enables drivers to use cell phones and MP3 players through voice commands, also comes with a call-for-help system. SYNC 911 Assist (or Emergency Assistance outside the U.S.) can make an emergency call using a paired cell phone after a severe crash where an airbag is deployed, or the fuel pump shut off. The call can be initiated automatically, although a vehicle occupant can choose to cancel it.

As well as providing the operator with a GPS location, the system can relay vital data such as impact velocity, crash type, safety belt usage, whether multiple impacts were sustained and whether airbags were deployed. This information helps the emergency services understand the severity of the incident and dispatch the most appropriate response.

Most of our vehicles also carry the SOS-Post Crash Alert System™, which 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
- Unlocks the vehicle doors
- Sounds the horn (non-European vehicles only)

A European Union regulation on "Automated Emergency Calling Systems" was finalized in 2017, becoming mandatory on April 1, 2018 for new vehicles. In parallel, a UN regulation was adopted in November 2017, covering all in-vehicle systems and requirements to drive harmonization of this technology on a global scale.

### Talking Tech Saves Lives

Trying to locate the source of a siren while driving can be stressful, and not getting out of the way can delay the progress of an emergency vehicle. So in 2017, we began trialing our new Emergency Vehicle Warning technology, designed to tell drivers if an emergency vehicle is approaching, and how far away it is. The technology could eventually advise drivers on the best course of evasive action.

*"Time is precious for emergency services and this technology could help to shave valuable seconds off their journeys by enabling drivers to avoid being an obstruction."*

#### Christian Ress

Supervisor, Automated Driving Europe, Ford Research and Advanced Engineering

Related Pages:

> [Vehicle Safety Performance](#)

> [Data: Vehicle Safety](#)

> [Driver Assist Technologies](#)

## ENCOURAGING SAFER DRIVING

**Driver safety goes way beyond the construction and safety features of a vehicle. We also encourage safer behavior through a range of driver education and awareness programs, including our global Ford Driving Skills for Life initiative.**

### Our Flagship Program: Ford Driving Skills for Life

Worldwide research shows that car crashes are the leading cause of death among young people. In Europe alone, more than 3,600 are killed in accidents each year, and two-thirds of these are drivers (EU, 2016). Anything we can do to reduce this number is time, money and effort well spent.

Our global [Ford Driving Skills for Life \(Ford DSFL\)](#) program was established 15 years ago by Ford Fund, in partnership with the Governors Highway Safety Association (GHSA) and a panel of experts. It gives newly qualified drivers the skills they need to drive safely and make good decisions behind the wheel in real-world situations. Training on speed and space awareness, distracted driving, vehicle handling and the simulated effects of drugs and alcohol are delivered – free of charge – through hands-on courses, in the classroom and via an interactive training center ("The Academy") on the [Ford DSFL website](#).

The program is expanding geographically and as it does, we adapt it to suit different regions. In North America and Europe, Ford DSFL programs are more focused on helping teenagers, the primary age group of first-time drivers. For example, our three-day DSFL course in London, held in November 2017, trained 470 young drivers, our highest participation rate yet. However, in many Asian, Middle Eastern and African markets, our novice driver participants cover a wider range of ages, as use of motor vehicles becomes more prevalent.

Related Page:

> [A Force for Good](#)

#### DSFL in Numbers

- **More than 1.03 million** young people and new drivers received free training since 2003
- Currently active in **41 countries**, with first-time programs in Hungary, Norway and Zambia
- Expanding to include **Cambodia, Czech Republic and Morocco**, and female drivers in **Saudi Arabia**, in 2018
- **40,000 participants worldwide** in 2017, with 32,000 taking part in hands-on training and 8,000 online
- **Over \$55 million** invested since 2003

## Addressing Driver Distraction

We conduct a significant amount of research into driver distraction, both on our own and with universities and organizations such as the Alliance of Automobile Manufacturers (Auto Alliance), to help make driving safer for everyone. The results gleaned from these studies has informed the development of a number of [driver assist technologies](#).

### Fatigue and Tiredness

Truck drivers often drive thousands of miles every year, making their profession tiring – and therefore potentially dangerous. In Brazil, more than 11 percent of truck drivers have been involved in a recent collision (Brazilian National Transport Confederation), so in 2017 our local Heavy Truck division developed innovative technology to help drivers recognize the signs of fatigue and act to stay safe.

The Safe Cap looks like a normal baseball cap, but it comes equipped with sensors that interpret the wearer's head movements. If they are tired or sleepy behind the wheel, an alert is issued through vibration, sound and light flashes. The prototype Safe Cap was tested for eight months in real driving conditions, and we hope that patenting and certification will follow.

### Driving Under the Influence

In Europe, alcohol is a factor in about 17 percent of road accident fatalities. In the United States, alcohol-impaired driving is involved in about 28 percent of traffic fatalities. Additionally, a National Highway Traffic Safety Administration (NHTSA) study found that about 20 percent of drivers surveyed tested positive for potentially impairing drugs.

To educate teens and new adult drivers about the dangers of driving while under the influence of alcohol or drugs, participants at some of our Ford DSFL driving clinics can try on our "[Drink Driving Suits](#)" and "[Drug Driving Suits](#)." These help them appreciate how being impaired can slow movement, reduce reaction times, and affect vision and coordination.

Ford DSFL courses in Europe also offer students the chance to experience the "[Hangover Suit](#)," which recreates the classic "morning after the night before" symptoms such as a throbbing head, dizziness, and feeling tired and weak. The 37-pound suit, created by Ford Europe, shows that even hungover driving can be as lethal as drunk driving.

### Cell Phones

Cell phone misuse is one of the biggest killers on British roads. Despite new laws and tougher penalties, over half of drivers in the U.K. still admit to using their phone while driving, while 37 percent have their phone in view (Ford and Brake).

To help change driver behavior, we launched a campaign with road safety charity Brake that banishes handsets to the glove box, which we renamed the "phone box." Prompting drivers to put their phone out of sight, we created a #MyNewPhonebox sticker, which we gave out at our annual DSFL event in London in November 2017.

Our Ford MyKey® system also helps parents encourage their teenagers to drive more safely. Available on millions of Ford and Lincoln vehicles, the programmable key can redirect incoming phone calls and text messages. It can also:

- Limit the vehicle's top speed
- Activate alarms until front occupants have fastened their safety belts
- Limit the volume on the audio system
- Prevent safety and driver assist systems from being disabled

Related Page:

> [Our Contribution to Society](#)

## Case Study

### Giving Young Drivers a Virtual Reality Check

In 2017, our work on driver distraction expanded into a collaboration with Google to produce Ford Reality Check, a virtual reality (VR) app that brings to life the potentially fatal consequences of distracted driving.

The first-of-its-kind experience, created with VR studio Happy Finish, uses Google Daydream VR to cast the participant as a distracted driver picking up friends on the way to a party. Instant messages, phone calls and chatty passengers all compete for attention, sparking a series of near misses before a final, fatal distraction.

The interruptions are based upon the most prevalent and dangerous distractions for this age group, including smartphones and passengers. The app tracks the time the driver takes their eyes off the road, displaying the total at the end.

In initial tests, 90 percent of app users said they would change their driving behavior.

*"Virtual reality is the ideal medium to highlight the dangers of distracted driving to young motorists and, by providing a chilling glimpse of how easily a crash could actually happen, we hope to encourage them to drive more safely. This age group is more likely to engage with VR, and studies suggest immersive experiences in virtual worlds can positively influence behaviors in the real world."*

**Jim Graham**

Manager, Ford Driving Skills for Life

# OPERATIONS

As well as managing the impacts of our production operations directly under our control, we accept that our environmental responsibility also extends to our wider supply chain.

## In this section

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

## What Our People Say

*“As we begin the construction of the new campus at our Dearborn headquarters, our sustainability group is in contact with the design and construction teams on the ground, to actively track progress against our goals and objectives. Although it’s still early, our hope is that these efforts will lead to significant improvements in the overall energy and environmental performance of the campus, exemplifying Ford’s commitment to sustainability.”*

**Kaitlin Sheehan**

Environmental Engineer, Environmental Quality Office, Ford Motor Company

## ENERGY AND EMISSIONS

At our manufacturing plants, rethinking the way we use energy is crucial to lowering our facility greenhouse gas (GHG) emissions and playing our part in addressing climate change.

### HOW WE'RE DRIVING CHANGE

#### Reducing Emissions and Energy Use

Our efforts involve using less energy to make our vehicles and driving down the GHG emissions from our manufacturing processes. To help us, we invest in state-of-the-art facilities to ensure quality, safety and lean production techniques.

Driven by our Plant Energy Team, our comprehensive Energy Management Operating System focuses our efforts in three key areas:

- Assessing and improving how our facilities operate
- Collecting, storing and managing data and analytics
- Securing a reliable supply of energy for our manufacturing plants

We also participate in GHG emissions reporting and trading, supporting a range of mandatory and voluntary schemes globally, and adhere to a number of national carbon reduction schemes.

#### Lower GHG Emissions From Our Facilities

In 2010, we set an ambitious goal to reduce GHG emissions per vehicle produced by 30 percent, by 2025. We're proud to say we reached that goal eight years early. In fact, we surpassed it. Between 2010 and 2017, we reduced our emissions by 32 percent to 0.67 tCO<sub>2</sub>/vehicle. We aim to continue building on this success.

#### Reduced Average Energy Consumption

In 2017, we reduced facility energy consumption (on a per-vehicle basis) by 6.8 percent compared to 2014, and we continue to focus on driving efficiencies in energy use throughout our facilities around the world. In addition, our focus on energy conservation and efficiency brought significant energy and cost savings.

## OUR PERFORMANCE

### Less Energy, Lower Emissions

Operational efficiency helps lower GHG emissions and facility energy use, and we're also exploring ways to use more renewable energy.

- **32% reduction** in GHG emissions per vehicle, 2010 to 2017
- **6.8% reduction** in facility energy consumption (per vehicle), compared to 2015
- Achieved our 2025 CO<sub>2</sub> emissions reduction target **eight years early**

## EFFICIENCY, FACILITIES AND LAND

Our activities and facilities have the potential to affect land use, nature and biodiversity, both directly and indirectly. We strive to make our operations as efficient and sustainable as possible, and have taken steps to improve biodiversity and wildlife habitat on our land.

### Committed to Green Buildings

As a member of the U.S. Green Building Council (USGBC) and supporter of its industry-standard LEED (Leadership in Energy and Environmental Design) rating system, we are committed to green buildings in our operations, following the basic principles of resource and process efficiency, life cycle assessments, health and safety, and environmental performance.

We strive to implement a range of best practices in our new facilities, from advanced water-treatment and waste-reduction systems to energy-saving technologies.

Related Page:

> [Waste Reduction](#)

### Efficiency: Lean Production in Action

A new \$25 million investment for additional manufacturing enhancements brings Ford's total investment at Kentucky Truck Plant in Louisville to \$925 million and allows the company to increase manufacturing line speed.

These investment and advanced manufacturing upgrades are examples of the company's quest to improve its operational fitness. They include 400 new robots, a new 3D printer that enables workers to make parts and tools more quickly and cheaper as well as enhanced data analytics to keep the assembly line moving as efficiently as possible.

## Case study

### Seeing the Future: Make Way for Holograms

Ford designers and engineers have been using visualization software and “mixed reality” headsets to review 3D designs with colleagues around the world in real time. Piloting Microsoft HoloLens technology, we're now able to explore shapes, sizes and textures in hours instead of the weeks and months needed to create clay models.

In our Dearborn studios, we have been trialing the technology, which allows our designers to see virtual design elements as if they were part of physical vehicles. It creates holograms in photo-quality backdrops, and can project design variations onto an actual car or clay model. This allows us to quickly evaluate the designs, make changes and determine styling options earlier in development.

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

*“HoloLens allows a whole team of people to collaborate, share and experience ideas together. Mixing virtual and physical models is exciting, because it helps our designers and engineers communicate effectively and ideate to see what the future looks like earlier in the process. This allows great freedom and efficiency in how prototypes are created or changed.”*

**Elizabeth Baron**

Virtual Reality and Advanced Visualization Technical Specialist, Ford

### Advanced Energy Infrastructure for Dearborn Campus

By 2020, our Research and Engineering Center on our Dearborn campus will be powered by a LEED-certified energy plant. Its highly efficient systems will consist of a gas-fired combined heat and power plant, advanced chiller technology, a thermal energy storage tank, and geothermal heating and cooling. In addition, a solar array could supply up to 4MW of electricity: enough to power more than 1,000 homes.

**We currently operate 26 LEED-certified buildings around the world.**

Related Pages:

> [Energy and Emissions](#)

> [Data: Operational Energy Use and CO<sub>2</sub> Emissions](#)

### Case study

#### The Birds and the Bees: Biodiversity and Sustainable Land Use

Promoting sustainable land use and improving the wildlife and biodiversity on the land around our facilities helps us do more than reduce our environmental footprint: it connects us with local communities.

For the last six years, we've been working on the Nashville GreenField Restoration project. A collaboration with Golder Associates and the Tennessee Environmental Council (TEC), GreenField Restoration turns the area around our old Glass Plant into a vibrant natural environment just five miles from downtown Nashville.

The GreenField Restoration project goes far beyond traditional compliance. With help from a diverse range of community partners, it includes reforestation, grassland and prairie reestablishment, creating a solar-powered rainwater irrigation system, developing a tree nursery and certified arboretum trail with 30 native tree species, as well as extensive bird and pollinator habitats. The site's natural vibrancy also makes it an ideal outdoor classroom for local students.

Our community partners have included STEM (science, technology, engineering and math) students from Vanderbilt College, representatives from local companies, Eagle Scouts and members of community organizations. Together, we've already made a vibrant green space just outside the city, where increasing numbers of birds, bees and butterflies are coming to live.

Related Page:

> [Environmental Impact of Our Suppliers](#)

With thousands of suppliers, from component manufacturers to freight partners, we are committed to reducing the environmental footprint of our entire supply chain.

## EMISSIONS FROM LOGISTICS OPERATIONS

**From receiving parts and components from our suppliers to delivering finished vehicles to our dealerships, our logistics operations represent a significant opportunity to reduce our environmental impacts, particularly with regard to emissions.**

### Managing Our Networks

To minimize the impacts of our inbound and outbound freight, we examine every opportunity to reduce the number of miles we travel and explore more fuel-efficient and lower-carbon modes of transport.

Overseen by our Material Planning and Logistics organization, our environmental initiatives are coordinated at a regional level. They include:

- Updating our fleets to ensure we comply with the latest requirements of ISO 14001 and other regulatory standards
- Improving the efficiency of our network to reduce emissions
- Measuring and reporting our freight greenhouse gas (GHG) emissions
- [Optimizing the packaging](#) to protect components and finished vehicles in transit

### How We're Reducing Freight Emissions

Freight emissions are dependent on a wide range of inter-related factors, including the type of transport used, the efficiency of the equipment and the design of the network. We seek to achieve emissions reductions by improving the efficiency of our processes, by adopting new technology and by using alternative modes of transport.



#### Network Efficiency

- Improved route planning
- Regional distribution centers to coordinate deliveries
- “Milk run” routes with several collection points



#### Drivers

- Training in fuel-efficient driving techniques



#### Vehicles

- Latest engine technologies
- Equipment modifications (e.g., deflectors, speed limiters)
- New packaging designs that carry extra loads
- Greater load density for fewer trips and lower fuel consumption



#### Other Transport Modes

- Using rail, sea and river transport to reduce emissions and road miles
- Multimodal solutions (e.g., “SWAP bodies”: road trailers that can also be used for rail)

### Measuring and Reporting Freight Emissions

Quantifying and reporting our freight emissions helps us minimize our total life cycle carbon emissions and reduce our overall environmental footprint. We measure all GHG emissions, including nitrous oxide and methane, using the “CO<sub>2</sub> equivalent” (CO<sub>2</sub>e) approach. Our logistics partners help us by collecting data from across our networks and collating it in a global scorecard.

Related Pages:

> [Reducing Vehicle CO<sub>2</sub> Emissions](#)

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

We also work with industry bodies and standards agencies to improve reporting methods, such as the [Scope 3 GHG Emissions Standard](#). This framework for reporting emissions throughout the value chain was developed by the [World Resources Institute \(WRI\)](#) and [World Business Council for Sustainable Development \(WBCSD\)](#). We now take account of “well-to-wheel” emissions that result from the production of the fuel and energy we use, and continue to adapt our methodology as necessary.

We are actively working with a team of students from the University of Michigan School for Environment and Sustainability (UM-SEAS) to evaluate our current CDP Scope 3 submission for accuracy, opportunities for improving its content and developing recommendations to incorporate into a future Scope 3 Reduction Strategy.

Through the Automotive Industry Action Group (AIAG) in North America, the U.K. Department for Transport and Odette International in Europe, we also encourage others in our industry to improve their measurement and reporting of GHG emissions.

Related Pages:

- > [Environmental Impact of Our Suppliers](#)
- > [Energy and Emissions](#)
- > [Data: Operational Energy Use and CO<sub>2</sub> Emissions](#)

## WATER USE

**Access to clean, affordable drinking water and adequate, accessible sanitation is a basic human right. Water resources are unevenly distributed across the planet and, with increased droughts, flooding and water stress caused by a combination of increased demand, poor management and climate change, water security is high on the global agenda.**

### HOW WE'RE DRIVING CHANGE

#### Every Drop Counts

Water is critical to our business, and parts of our operations, such as our paint shops, are particularly water-intensive. But by continually striving to use less water in our operations, and throughout our supply chain, we can protect the environment, reduce costs and ensure our future resilience.

We acknowledge our responsibility to use and manage water sources efficiently and sustainably, especially as we have operations in many water-stressed regions of the world such as India, South Africa, Mexico and Brazil.

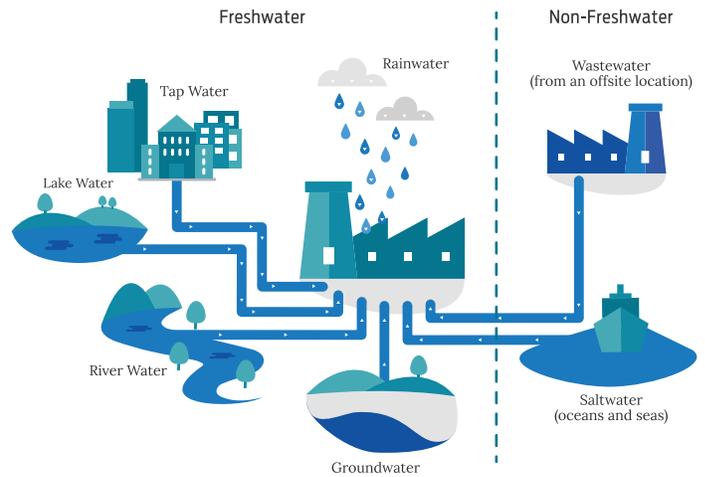
#### Our Water Strategy

Our long-term water strategy reflects the need to understand water challenges in their local context. Throughout the world, we rely on water from a variety of freshwater and non-freshwater sources.

We place particular emphasis on reducing our usage of freshwater (from rivers and lakes, rainwater, groundwater and municipal sources) because it is the main source of drinking water. We're doing this through a combination of reduced consumption, utilizing non-water-based technologies and tapping into alternative sources such as other companies' wastewater.

By reducing our reliance on freshwater, we will achieve our goal of restricting potable water sources for human use. Our 2020 target, to reduce water use per vehicle produced by 30 percent from 2015 to 2020, represents a significant challenge but it's a vital step forward if we are to manufacture vehicles without withdrawing any drinkable water.

## Water Use at Our Facilities



### What Is Freshwater?

Freshwater is the main source of drinking water around the world and is recognized as essential for human life and well-being in the Global Reporting Initiative's (GRI) Standard 303. Definitions of freshwater include:

- “surface and ground waters” – United Nations Economic Commission for Europe (UNECE)
- “all water other than oceans and other saline water, therefore freshwater is glaciers/ice caps, groundwater, and surface water” – United States Geological Survey (USGS)

The GRI defines freshwater as surface water, but our definition is broader, including both surface water and groundwater. Our goal is to minimize our use of freshwater while aiming for a goal of zero – or even positive – impact on freshwater sources in the future.

To achieve this, we're incentivizing the reduction of freshwater use in our facilities. These behaviors include using alternative water sources like industrial wastewater, and introducing technologies like MQL, Dry-Booth and alternative cooling that don't use water.

## Salient Issue

### Access to Water and Sanitation

During our first formal human rights saliency assessment, we identified access to water and sanitation as one of our nine most important issues – those at risk of the most severe negative impact through Ford's activities and business relationships.

Going forward, we're taking steps to develop action plans to manage and remediate these issues, and to expand our reporting on them.

- > [Find out more about our human rights saliency assessment](#)

### Reducing Water Use in Our Facilities

Since 2000, we have reduced our operational water use by 62.5 percent, saving 10.4 billion gallons of water. In 2017, we continued our trend of ongoing improvement with a further overall reduction of 2 percent, while our South African facilities reduced their per-vehicle water use by 10 percent from the previous year.

To help us, we're introducing more water-efficient processes and technologies such as water alarm systems and a data monitoring center to better measure our water use. We are also using the Ceres Aqua Gauge assessment tool for managing our water risks at a corporate level, and [using water reuse to manage our impacts from Chennai to Chihuahua](#).

## Leadership on Water

We recognize the human right to clean, affordable drinking water and adequate, accessible sanitation, and focus on responsible water stewardship in our operations.

We're proud to be a signatory to the UN CEO Water Mandate and one of only 74 publicly listed companies (out of 742 assessed) to appear in the CDP Water A List for three consecutive years. See the [CDP's 2017 Global Water Report](#) for more information about the Water A List and the business case for action on water security.

### OUR PERFORMANCE

## Responsible Water Stewardship

Access to clean water and adequate sanitation is a basic human right, so we're focused on avoiding any negative impacts on water resources.

- We saved **3.7 m<sup>3</sup> of water** per vehicle in 2017, equal to our usage last year and down from 3.9 m<sup>3</sup> in 2015
- Since 2000, we have saved enough water to fill **15,735 Olympic-sized swimming pools**
- **32% reduction** in water use (per vehicle), 2010 to 2017

## COLLABORATING ON WATER

**Since 2000, when we first set ourselves targets for water, we have broadened our efforts, working with supply chain and community partners to address water challenges. We're also working with business partners to find more cost-effective ways of reducing our water use.**

## Collective Efforts to Find Solutions

Ford is one of more than 140 companies worldwide that endorses the UN Global Compact CEO Water Mandate. Our water strategy aligns with the six core elements of the mandate, which focus on Direct Operations; Supply Chain and Watershed Management; Collective Action; Public Policy; Community Engagement; and Transparency.

### Water Reductions in Our Direct Operations...

In 2018, we're starting to closely track the percentage of non-freshwater used in our operations and to find alternative sources like greywater and wastewater from other organizations.

## Case Study

### How We Reached 100 Percent Recycled Water for Operations at Chihuahua and Chennai

At our Chennai site in India and our Chihuahua Engine Plant in Mexico, we use only potable water for domestic use while using treated non-potable water sources in production.

At both facilities, we have developed partnerships with local authorities to invest in infrastructure to facilitate the recycling and reuse of treated municipal wastewater.

Over 10 years ago in Chihuahua, we began treating externally sourced treated wastewater to achieve 100 percent recycled water for operational uses with potable water for domestic use only. After treating and extracting the recycled water, any final discharge from our recovery system goes to an evaporation lagoon, eliminating any discharge from the site. In 2018, the site was expanded with a new three-pipe water distribution system. This new system uses not only high-quality treated wastewater in production and potable water for domestic use, but also quality treated gray wastewater for use in toilets, which reduces the plant's freshwater demand even further.

At Chennai, we utilize wastewater from our own site and treated wastewater from the local supplier park to feed our recycling system. The treated wastewater goes through a three-stage reverse osmosis system, followed by evaporation and crystallization. This maximizes the amount of recycled water we can extract and eliminates any liquid discharge from the facility.

At Ford manufacturing facilities worldwide, we are always looking for ways – both hi-tech and otherwise – to reduce net water usage. These include utilizing stormwater, installing minimum quantity lubricant (MQL) machining, and the installation of dry paint booths.

Internal and external treated wastewater recycling is a critical piece of Ford's "Go Further" water conservation mindset, and our successes in Chennai and Chihuahua create a framework for exploring alternative water sources at other facilities as we move forward.

### ...With Our Suppliers

We recognize that we can't tackle water issues by ourselves, and that our water impact doesn't stop at our factory walls – it includes the impacts of the suppliers who make parts and components for us. That's why we have a formal program to reduce our broader footprint: the Partnership for a Cleaner Environment (PACE) program. A truly collaborative effort, this voluntary program fosters partnerships to solve challenges and shares best practices with suppliers.

Ford suppliers participating in PACE are on track to save an estimated 782 million gallons of water over the next five years – enough to fill 1,192 Olympic-sized swimming pools – according to data collected in 2017.

- Five suppliers expect to save 244 million gallons by reusing process wastewater, rainwater and reclaimed condensate in other facility processes
- Other PACE participants report that their savings will be achieved by implementing closed-loop cooling, upgrading equipment, engaging and training employees, and developing a comprehensive water balance for each facility

Related Page:

> [Environmental Impact of Our Suppliers](#)

### ...and in Our Communities

Hundreds of employee volunteers are also engaged in our community-based efforts to conserve water and promote responsible water stewardship.

- In Thailand, Ford volunteers installed a water system for a nursery's agriculture project, as part of the renovation of the Special Education Center in Rayong, and helped build a solar-powered water system for Ban Bueng Ta Ta School through the Water Go Green project.
- Ford Argentina employees work with a local NGO, Movimiento Agua y Juventud, to give rural communities and schools access to safe water. In December 2017, a project to provide access to safe water supplies in two communities in Santiago del Estero Province was completed, with 270 beneficiaries.

Related Pages:

> [Water Use](#)

> [Data: Water](#)

## WASTE REDUCTION

The automotive industry is a resource-intensive one, so we need to work hard to optimize our resource efficiency. This means generating less waste, and repurposing or recycling any waste we do generate. This not only keeps it out of landfill but provides us with an additional supply of valuable resources.

### HOW WE'RE DRIVING CHANGE

#### Our Plan

Our aim is to minimize manufacturing and production waste, helping to reduce the overall environmental impact of our operations. Our global waste-reduction plan outlines how we will seek to avoid waste to landfill wherever practicable, through the efficient use of resources and by developing closed-loop recycling processes.

#### Going for Zero

When a facility acquires the zero waste to landfill (ZWTL) status, it means that absolutely no manufacturing waste from the facility goes to landfill sites. Our current major waste streams include wastewater sludge; recovered paint solids; packaging waste; and used oils and waste solvent.

To ensure that even more of our plants and facilities reach ZWTL status, we continue to implement a range of waste-reduction initiatives. These include:

- Investing in new technologies and programs that minimize waste
- Standardizing how we track and sort waste to aid recycling and reuse
- Identifying and focusing on the five main sources of waste to landfill at each facility
- Working with suppliers to increase their use of [eco-friendly packaging](#)

#### Meeting Our Waste Targets

To continue to reduce the amount of landfill waste associated with vehicle production, we set ourselves a challenging target: to reduce waste to landfill by 40 percent per vehicle between 2011 and 2016. We reduced waste to landfill on a per-vehicle basis by 18 percent last year, and by 61 percent over the last five years, significantly exceeding our target.

Around the world, our facilities sent 21,000 metric tons of waste to landfill – a decrease of 42 percent from 2013; production increased by 0.7 percent over the same period.

### OUR PERFORMANCE

#### Aiming for Zero Waste to Landfill

Our global waste-reduction plan is helping us reduce the environmental impact of our operations.

- **Nine Ford sites achieved zero waste to landfill** status in 2017,<sup>1</sup> bringing our total to 85
- **38% reduction** in waste to landfill per vehicle, 2015 to 2017
- We save **3 million pounds** of landfill waste each year with our grinding swarf (metallic particles, abrasives and oils) recycling program
- **61% reduction** in waste-to-landfill per vehicle since 2013

<sup>1</sup> Taubaté foundry sand is sent to landfill due to lack of technically viable alternatives in the region.

## TAKING ACTION TO CUT WASTE

We are using a variety of technologies and programs across our operations to ensure we generate less waste, turn waste streams into valuable resources and reduce the impact of packaging.

### Our Waste-Reduction Efforts

In our global effort to reduce waste to landfill in line with [our target](#), we've undertaken a selection of waste-reduction initiatives across our global operations. These include:

- Reducing high volume waste streams such as wastewater treatment plant sludge and paint sludge
- Focusing on sustainable waste management, particularly increasing the amount of recyclables that are recovered from trash
- Focusing on reduction of single-use plastics

#### More Zero Waste to Landfill Sites

A total of 85 facilities around the world have now achieved Zero Waste to Landfill (ZWTL) status. These include:

- All our manufacturing facilities in Canada and Mexico
- All our European Blue Oval manufacturing facilities
- The historical Ford Rouge Center, our largest ZWTL site, which avoids sending 14 million pounds of waste to landfill each year
- Our North American World Headquarters in Dearborn (Michigan), Oakville (Ontario) and Santa Fe (Mexico), which divert 240,000 pounds of waste from landfill between them

### Closing the Loop on Aluminum Recycling

To reduce waste and use resources more sustainably, we try to reuse materials where we can, a process known as “closed-loop recycling”

For example, aluminum can be reused many times without loss of quality, requiring 95 percent less energy than producing new aluminum. We have aluminum recycling systems at our Dearborn and Buffalo stamping plants, and our Kentucky truck plant. As vehicle parts are stamped, scrap material is shredded, separated into four different grades of alloy, and sent for reprocessing.

Related Page:

> [Using Sustainable Materials](#)

### Reducing the Impact of Packaging

Packaging is a key part of the automotive supply chain and plays an important role in ensuring that components reach our facilities in the right condition. Our standard range of packaging not only protects its contents but also maximizes payload during transportation and reduces cost. We always review the packaging of components and parts before we launch any new product, to find opportunities for improvement.

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.

Using standardized containers makes packaging more transferable between suppliers and across programs. In many locations, we have contracts with packaging providers to collect and store the packaging for our suppliers. By forwarding it to where it is needed rather than needlessly returning it to the previous supplier, we have significantly reduced our overall transport impact.

Related Pages:

> [Environmental Impact of Our Suppliers](#)

> [Data: Waste](#)

## ENVIRONMENTAL IMPACT OF OUR SUPPLIERS

We rely on thousands of suppliers to provide the materials, parts and services we need to make our products. By sharing best practice between us, we can help them to lower their costs, improve the quality of their products and services, and meet their own sustainability targets.

### HOW WE'RE DRIVING CHANGE

#### A Complex Supply Chain

As well as directly managing the impacts of Ford-owned and operated facilities around the globe, we also have a responsibility to help our suppliers reduce their environmental footprint while ensuring social standards.

The automotive supply chain is complex, with many tiers of suppliers and sub-suppliers between the original source of the materials used in the manufacturing process and the likes of Ford. Our supply chain includes suppliers of parts and components for vehicle production, as well as indirect suppliers of facilities, equipment, materials and services.

We use the [Partnership for A Cleaner Environment \(PACE\)](#), our supply chain sustainability initiative, to reduce the overall environmental impact of Ford and our supply chain partners.

#### Our Supply Chain

##### Operations

- \$110+ billion global spend on goods and services
- 67 Ford manufacturing sites

##### Production Suppliers

- 1,200+ Tier 1 supplier companies
- 60+ countries
- 4,400+ supplier sites
- 100,000+ parts manufactured
- 500+ commodities sourced

##### Indirect Suppliers

- c.10,000 supplier companies
- 600+ commodities managed

#### Understanding Our Suppliers' Impact

To better understand our suppliers' greenhouse gas (GHG) emissions and water use, and address the risks and opportunities associated with them, we survey a selection of our supply base every year, using the CDP Supply Chain program's Climate Change and Water Security questionnaires.

The production suppliers and indirect suppliers of logistics and information technology services surveyed are selected based on the emissions or water intensity of their operations, their geographic footprint and the strategic nature of their relationship with us.

Together, these two surveys provide us with qualitative and quantitative information about how our suppliers manage environmental risks and impacts, helping us to identify "hotspots" for GHG emissions and water use.

### OUR PERFORMANCE

#### A Lighter Supply Chain Footprint

We work with thousands of suppliers, sharing best practice and helping them reduce the environmental footprint of their operations.

- 264 suppliers surveyed using CDP Supply Chain questionnaire (81% response rate)
- 209 suppliers surveyed using CDP Water questionnaire (75% response rate)
- 81% of suppliers reported integrating climate change into their business strategy in 2017 (2016: 82%)
- 69% of suppliers reported having a water-related target or goal in 2017 (2016: 64%)
- 81% of suppliers reported having an emissions reduction target or goal in 2017 (2016: 64%)

## REDUCING OUR COLLECTIVE FOOTPRINT

We liaise with our suppliers, and with wider industry partners, in an attempt to reduce the environmental impacts not just of our supply chain but of the automotive industry as a whole.

#### Building Supplier Capability Through PACE

Our supply chain sustainability initiative, the Partnership for A Cleaner Environment (PACE), was developed to reduce the overall environmental impact of Ford and our supply chain partners.

PACE enables us to share the best practice examples we've implemented with 50 suppliers, so that they can be replicated and we can minimize our overall environmental impact. We also encourage our Tier 1 suppliers to cascade the information down to their own suppliers to extend the reach of the program.

#### PACE at a Glance



#### Engaging With Key Suppliers

One of the ways we engage with our key strategic suppliers is through our Aligned Business Framework (ABF). This dialogue helps to drive quality and innovation, identify operational synergies and encourage collaboration in areas such as ethical business practices, working conditions and responsible sourcing.

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

- Ford verifies that the supplier has a code of conduct that aligns with our own [Policy Letter 24](#)
- The supplier provides internal training to ensure its employees understand and comply with the code of conduct, and Ford validates their processes to ensure ongoing alignment
- The supplier also verifies that its own suppliers are compliant with our shared standards and expectations

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## Our ABF Network

### 114 suppliers comprising:

- 84 production suppliers and 30 indirect suppliers
- 15 of these are minority-, veteran- and women-owned suppliers

### Of our production suppliers:

- 100% have codes of conduct aligned with our [Policy Letter 24](#)
- 85% have governance systems covering their operations and supply chains

› [Download a list of our ABF Suppliers](#)

## Recognizing Supplier Excellence

We honor our suppliers for their outstanding performance and achievements with our World Excellence Awards. At the 19th annual ceremony, held at The Henry Ford Museum in Dearborn in May 2017, Ford recognized 54 suppliers from across the globe with awards. In addition, four companies received Special Recognition awards. [See a full list of World Excellence Award Winners.](#)

## Collaborating With Industry Partners

To maximize our efforts and encourage alignment throughout the automotive supply chain, we participate in several industry forums.

- As a founder of the [Automotive Industry Action Group's \(AIAG\)](#) Environmental Sustainability Advisory Group, and member of the Greenhouse Gas Work Group, we help integrate environmental sustainability, water benchmarking and GHG management across the sector. Along with other OEMs, we developed one-day supplier training programs for GHG emissions and water management, which provide guidance on calculations and sustainability strategy development.
- We have worked alongside other members of the Environmental Science Work Group at the [Responsible Business Alliance \(RBA\)](#) – formerly the Electronic Industry Citizenship Coalition (EICC) – to strengthen the standards for environmental responsibility in the RBA Code of Conduct in 2017. Third-party environmental audits are conducted at selected supplier sites to evaluate their environmental practices. Read more about the [RBA audit process.](#)
- Through our membership of the Suppliers Partnership for the Environment – a collaboration among automotive OEMs, their suppliers and the U.S. Environmental Protection Agency – we are working to advance responsible battery management at vehicle end-of-life, increase biodiversity and reduce waste.

Related Pages:

› [Our Value Chain and Impacts](#)

› [Environmental Impact of Our Suppliers](#)

› [Transparency Throughout The Supply Chain](#)

# PEOPLE AND SOCIETY

**Our whole Ford family – employees, contractors and dealers – is committed to the belief that freedom of movement drives human progress.**

## In this section

- [Our People](#)
- [Human Rights](#)
- [Global Mobility](#)
- [Our Contribution to Society](#)

## What Our People Say

*"I actually feel like I am making a difference to better the world. It's been one of the most exciting times in my 15 years at Ford. Seeing the passion with the employees invigorates my level of excitement. I honestly enjoy coming to work every day."*

**Joe Fodera**

Research Operations Manager, Ford Motor Company

## OUR PEOPLE

**As we transform our business, we need to attract and nurture diverse, talented people and provide them with a great place to work.**

### HOW WE'RE DRIVING CHANGE

#### Being an Employer of Choice

We want to be recognized as an employer of choice, wherever we operate.

To achieve that, we are:

- **Transforming our culture and the way we work**
- **Focusing on employee well-being and safety**
- **Upgrading our campuses through Ford Land**
- **Embracing diversity and inclusion**
- **Attracting and retaining the right talent**
- **Investing in learning and development**

### OUR PERFORMANCE

#### Putting People First

We aim to develop a skilled, motivated and diverse workforce, and provide safe, collaborative workplaces in which our people can fulfill their potential.

- **202,275** people employed globally at the end of 2017
- **988** increase in employees since the end of 2016
- **67** manufacturing sites around the world

## UNLEASHING THE BEST IN OUR PEOPLE

**Bringing to life our commitment to become the world's most trusted mobility company requires us to change the way we work, transform our culture and unleash the best in our people.**

### Transforming Our Culture and the Way We Work

The automotive industry is changing rapidly. Technological innovation, changing customer expectations and a world that is increasingly crowded and urbanized are all driving change at a scale and rate that are without precedent.

Our response is to transform Ford into an auto *and* mobility company, designing smart vehicles for a smart world that help people move more safely, confidently and freely. Making this fundamental change means drawing on our trusted 114-year legacy, our love and passion for freedom of movement, and our ambition for the future. It requires us to transform our culture, bringing forward the best of our past, and paving new ways of working. In addition, it means putting people first – leveraging human-centered design in everything we do, including our people processes, so that we bring out the best in our workforce.

### Putting People First Through Human-Centered Design

In 2016, we launched a new program called HRRev to transform our people-related products and services in a way that significantly improves the employee experience. This includes leveraging leading technology, simplified and integrated processes, and consumer-grade service centers to support employee inquiries and moments that matter.

Our "People First" service center promise to our employees is simple...

- **We bring expertise and consistency**
- **We make it simple for you**
- **We listen and care about you**
- **We respect confidentiality and act with integrity**

We have taken a human-centered design approach to drive our cultural transformation. Over 7,000 hourly and salaried employees across the globe have provided input into this through focus groups, prototype testing, observations, experiments, surveys and polling.

Our employees identified the moments that matter most such as onboarding, policy changes, a key life event (for example, the birth of a child), new job transition and giving and receiving feedback. They told us they want:

- Simple, intuitive, integrated experiences
- Anytime, anywhere, any-device access
- Choice in how they interact with us, including online, telephony, chat and email
- To be able to provide point-in-time feedback

In October 2018, we will be launching a global, next-generation "Life@Ford" portal and three new "People First" service centers to support our global workforce. This will include online, fully mobile policies, processes and programs and will enable employees to connect via telephony, chat or email with People First professionals when they need help. It will also include newly engineered processes like the "Partnership Discussion," which is an informal, future-focused conversation on growth, development, goal setting and the employee/supervisor relationship. With these changes, we hope to empower and enable our workforce to be the best they can be.

Related Page:

> [Learning and Development](#)

## Employee Engagement and Satisfaction

### Communicating With Our People

With so many employees globally, effective, two-way communication is key to our success. To achieve this, we use a range of communication channels, including our Intranet site, website and Jim Hackett’s video blog; 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 \(see below\)](#).

### Assessing Employee Satisfaction

Through our annual Global Pulse Survey, we encourage our employees to provide honest feedback about their jobs, workplace and overall satisfaction with Ford. Results feed into reports that are used to inform discussions and improvements plans, aimed at positive trends – an annual performance objective for many senior managers. The survey results are also benchmarked externally, so we can better understand how we are performing in a wider context. In 2017, our Employee Satisfaction Index score was 72 percent, 2 percent above the external benchmark. Our Employee Engagement score was 84 percent (no external benchmark is available for this).

Related Page:

> [Data: Employee Engagement](#)

## 2017 Global Pulse Survey Results

**Results from our annual PULSE survey were strong once again and we continue to exceed external benchmarks.**

### What Are Employees Saying?

Overall, Ford employees are satisfied and engaged.

#### 2017 results

Total Ford Satisfaction Index

72%

Benchmark Satisfaction Index

70%

Total Ford Engagement Index

84%

### Highlights

**81%** of respondents are satisfied with their job

**83%** of respondents are satisfied with their supervisor

**71%** of respondents are satisfied with the company

### How Do We Compare?

**Ford exceeded external scores on the Employee Satisfaction Index (ESI) and on 20 questions that are benchmarked.**

My workgroup has a climate in which diverse perspectives are valued:

**8 percentage points above benchmark**

I can report unethical practices without fear of reprisal:

**7 percentage points above benchmark**

Proud to work for Ford; Workgroup has a clear understanding of customer needs; Supervisor satisfaction; and Opportunity to improve skills:

**6 percentage points above benchmark**

Related Pages:

> [Health and Safety](#)

> [Diversity and Inclusion](#)

> [Attraction and Retention](#)

## HEALTH AND SAFETY

**The safety and health of our people is something we take very seriously. Throughout our operations, robust policies and practices are in place to ensure a safe working environment. Our health and safety policy demonstrates this progress and we continually strive to be world class in safety.**

*Our health and safety commitment states our people are our most valuable asset. Nothing is more important than their safety and well-being. Our co-workers and families rely on this commitment.*

### Salient Issue

#### Health and safety

During our first formal human rights saliency assessment, we identified health and safety as one of our nine most important issues – those at risk of the most severe negative impact through Ford’s activities and business relationships.

Going forward, we’re taking steps to develop action plans to manage and remediate these issues, and to expand our reporting on them.

> [Find out more about our human rights saliency assessment](#)

### Reinforcing Our Strong Safety Culture



Our strong safety culture is supported by effective communication through multiple channels that engages employees and contractors in understanding and following our safety programs and policies. Our sites hold regular talks and events focusing on key safety issues. Employees are encouraged to report every injury, hazard or near-miss, so we can take appropriate corrective actions to prevent recurrences and create a safer workplace for all.

External benchmarking helps us achieve best-in-class performance. We participate in multi-industry groups, both in the automotive sector and beyond, which share information on safety practices and industry trends, and explore potential collaborations to address current issues.

### Our Safety Record

Any loss of life or serious injury in our facilities is unacceptable and deeply regretted. In 2017, we experienced two fatalities, one involving a Ford employee, the other a contractor. Both occurred in North America. As with any workplace incident, the circumstances were analyzed in detail, with actions taken to prevent reoccurrence.

Another key safety indicator is lost-time case rate (LTCR). Our LTCR at the end of 2017 was 0.38. We are currently on target to meet our 2018 objective of 0.36. This metric measures the number of days away from work following a work-related injury or illness.

#### Lost-Time Case Rate

|  | Cases per 200,000 hours worked |      |                       |
|--|--------------------------------|------|-----------------------|
|  | 2015                           | 2016 | 2017                  |
| Ford global rate                                       | 0.43                           | 0.39 | <b>0.38</b>           |
| U.S. Motor Vehicle Manufacturing (NAICS 3361/SIC 3711) | 1.6                            | 1.7  | <b>NA<sup>1</sup></b> |

Data notes and analysis:

1. Not available until late 2018

Also see:

> [Health and Safety](#)

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*Our wellness vision is to foster knowledgeable employees, engaged in their own health and well-being, to Go Further at work, home and into retirement.*

## Tailored Offerings and Informed Choices

The health and well-being of our entire workforce is a key driver of performance at Ford. We provide resources to help individuals make informed choices when they are interacting with the health care system. In 2017, 80 percent of our U.S. salaried active employees participated in our annual wellness program. These are designed to help participants in our health plan gain a better understanding of their own health status and receive appropriate preventative care. Helping our employees to avoid serious diseases and manage chronic conditions effectively has a positive impact on both their quality of life and our success. And, as good habits tend to be shared between friends and family, promoting health among our employees can help develop healthier communities as well.

Related Pages:

- > [Unleashing the Best in Our People](#)
- > [Attraction and Retention](#)

## DIVERSITY AND INCLUSION

**We are proud that our workforce reflects the communities in which we live and work. We embrace diversity and inclusion at every level of the company. Employing people with different backgrounds, opinions, experiences and perspectives makes us a stronger business, and helps to foster a truly collaborative workplace.**

### Building an Inclusive Environment

Inclusion has been as much a part of our history as the products our diverse employees have created. We take pride in a workforce that reflects the society in which we live and work. And, by embedding diversity and inclusion in every aspect of what we do, we make ourselves stronger, leveraging our employees' talents and opening up to fresh ideas, perspectives, experiences and new ways of thinking in a truly collaborative environment.

Diversity and inclusion requires cross-functional collaboration within Ford, as well as with [dealer groups](#) and [supplier organizations](#).

- > [Watch a video about diversity and inclusion at Ford](#)

## Case Study

### Taking Action in Chicago

**We are providing more than 20,000 hours of training for all employees, as well as additional leadership and diversity training for all salaried employees.**

We have investigated and taken action in response to complaints we have received of harassment and discrimination at our Chicago plants. Regrettably, some of the alleged misconduct was true. As Ford President and CEO Jim Hackett indicated in his open letter issued earlier this year, we are deeply disappointed that at any time any of our employees may have thought that harassing conduct was acceptable behavior, and we are sorry for any instance where an employee was subjected to harassment or discriminatory conduct. We are intent on rooting out this conduct and handling it appropriately.

In addition, starting more than two years ago, we have taken further actions at our Chicago plants to reinforce our policies and to ensure an appropriate workplace there. Those actions include conducting more than 20,000 hours of training for all hourly and salaried employees to reinforce a standard of respect that is non-negotiable, as well as providing additional leadership and diversity training for all salaried employees and delivering additional training for our human resources teams. We have also increased human resources staff to provide additional investigations support and oversight, including a staff member who oversees investigations at both plants and reports directly to Personnel Relations at Ford headquarters in Dearborn.

Further, last summer, we entered a substantial agreement with the Equal Employment Opportunity Commission (EEOC) to address the complaints that were raised at our Chicago area plants, institute further changes in the workplace and provide meaningful relief to employees who are determined to have experienced harassment. We have agreed to pay up to \$10.125 million to resolve claims through the claims process, under which employees will receive a financial award if an independent panel agrees with their harassment or discrimination complaint. If there is money remaining, we will use it for equal employment opportunity purposes, such as training. We are actively working with the EEOC right now to implement that agreement, which also establishes the panel of three independent monitors, none of whom work at Ford, to oversee compliance related to harassment and discrimination for the next five years.

## Salient Issue

### Harassment and Discrimination

During our first formal human rights saliency assessment, we identified harassment and discrimination as one of our nine most important issues – those at risk of the most severe negative impact through Ford's activities and business relationships.

Going forward, we're taking steps to develop action plans to manage and remediate these issues, and to expand our reporting on them.

- > [Find out more about our human rights saliency assessment](#)

### Our Five Focus Areas

Our diversity and inclusion efforts are aligned with five strategic areas of focus:

#### Leading the Way



Our executive leadership team, including our Chief Diversity Officer Meeta Huggins, champions diversity and inclusion, integrating them into business objectives and human resources processes, and employees exhibiting respectful and inclusive behaviors.

#### Diverse Workforce



All employees are welcome to participate in our Employee Resource Groups (ERGs). ERGs 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.



### Respectful and Inclusive Workforce

We promote employee accountability for inclusion by communicating expected behaviors via our Intranet site and through training, and by celebrating the winners of our diversity and inclusion awards in internal newsletters. Additional resources include employee assistance programs, wellness initiatives, rooms for nursing mothers and meditation rooms. In 2017, we began reporting harassment metrics to the board, and strengthened our harassment reporting process around the world.

For example, we recently recomunicated the expectation that employees and bystanders need to report incidences of harassment, discrimination and retaliation. In addition, the company launched “Speak Up” at the end of May 2018. With a website and email address that will be communicated to all hourly and salaried employees globally, Speak Up offers a single, streamlined way to report harassment.



### Work-Life Flexibility

Among the options made available to many employees are reduced and/or flexible schedules, job sharing, telecommuting, digital tools to improve productivity and communication tools.



### Strategic Partnerships

In collaboration with other agencies, our businesses around the world develop partnerships to promote diversity and inclusion within communities and within the company.

## Case Study

### Ford’s Career Re-Entry Program

Ford currently participates in a “re-entry” program that was developed in 2016 through a partnership between the Society of Women Engineers (SWE) and iRelaunch. Ford’s career re-entry program, similar to an internship, is for experienced professionals who have voluntarily taken a career break and would like to return to the workforce. The program allows Ford to tap into resources focused on science, technology, engineering, art and math (STEAM), while increasing the pipeline of diversity candidates.

Participants are placed on a six-month program and, based on performance, can become full-time employees. Throughout the program, participants build upon their past work experience and gain new skills through work aligned with their area of expertise. They experience a robust curriculum, with an emphasis on professional development, mentoring, networking, and exposure to senior-level management, preparing them to shift gears back into the workforce while learning more about Ford and our culture. In 2017, positions were filled across information technology, manufacturing and product development.

*“This program helps us build our talent pipeline, plus it’s a great way for individuals re-entering the workforce to gain the professional development and mentorship they need to navigate their return to work in a technical field.”*

#### Meeta Huggins

Chief Diversity Officer & Talent Acquisition Operations Director, Ford Motor Company

Related Pages:

- > [Attraction and Retention](#)
- > [Learning and Development](#)

### 2017 Diversity Performance

> [More information on our U.S. workforce can be found in the GRI Content Index](#)

#### Of our global salaried workforce

- 26.9% were female
- 19.1% of managers<sup>1</sup> were female

1. Middle management and above

#### Of our 12-member Board of Directors:

- 3 were women
- 2 identified themselves as members of minority groups

#### Of our U.S. employees (hourly and salaried):

- 31% were members of minority groups
- 23.6% were female

#### Of our 48 corporate officers:

- 7 were women
- 8 identified themselves as members of minority groups

### Another Perfect Score in Corporate Equality Index

In December 2017, Ford once again earned 100 percent on the Human Rights Campaign 2018 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 2018 Index rated 1,084 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.

### Ford Global Pay Equity Statement

A core principle of our talent management strategy is a longstanding commitment to equal opportunity in all aspects of employment, including the way Ford compensates its employees. Ford employee compensation in each market should be fair and equitable, irrespective of gender, race or similar personal characteristics. This applies to all forms of pay, including base salary, incentives, bonuses and other forms of compensation.

Ford reviews and updates people processes on a regular basis to help protect against bias and promote a diverse and inclusive environment.

Related Pages:

- > [Unleashing the Best in Our People](#)
- > [A Force for Good](#)

## ATTRACTION AND RETENTION

**Ford is always searching for the best and brightest talent who can take our business forward. That means finding candidates with innovative ideas and a customer-centric mind-set.**

### Finding the Right Talent...

We aim to attract a diverse range of qualified candidates for all our jobs. To do this, we partner with professional organizations, build relationships with top universities, and utilize digital tools to find the best students and recent graduates. Our executives often visit campuses, sharing information and meeting the next generation of potential automotive leaders.

We also attend meetings in the communities in which we live and work to foster relationships with individuals and companies, to build connections and expand collaboration.

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In 2017, we began onboarding our employees in a streamlined and more efficient way. New hires can now complete their tasks and paperwork in a customized web portal prior to their arrival. This allows the new employee to spend their first day being immersed in Ford Motor Company and their new role, rather than completing forms.

#### Why Ford?

In a series of focus groups across all regions, employees told us why they were attracted to Ford:

- **Ford's history, reputation and brand value**
- **The development and career opportunities available**
- **The range of both formal and informal training opportunities**
- **The importance of diversity**
- **The people, the family culture and Ford values**

Related Pages:

- > [Unleashing the Best in Our People](#)
- > [Diversity and Inclusion](#)

### ...And Keeping the Best Onboard

Finding and hiring the right candidates is important, but so too is ensuring they have a strong onboarding experience once they join. We know this plays a significant part in aiding and improving employee retention. Our U.S. onboarding program, Get Started, equips new employees with the tools and networks that enable them to be productive as soon as possible.

Get Started includes a company overview and corporate orientation, which features presentations, Q&As with each skill team area and meet-and-greets with Ford's senior leaders, as well as providing new recruits with the resources available to them. Additionally, our internal social media platform The Hub further engages new employees and helps build the Get Started community.

Related Pages:

- > [Learning and Development](#)
- > [Data: Voluntary Quit Rate by Major Markets \(Salaried Employees\)](#)

### Ford Ranked Among World's Most Attractive Employers

Ford is proud to say we are one of the world's most attractive employers according to [Universum's 2017 Talent Survey](#), taken by more than 294,000 students in the world's 12 largest economies. The annual survey ranked our company based on characteristics like work environment, innovation, future earnings, and leadership in development.

Ford was ranked 12th by those studying engineering and 42nd among business students.

*"We are committed to hiring the best and brightest leaders, while continually expanding the diversity of our entire team. We know that a diverse workforce truly makes us a strong company."*

#### Kiersten Robinson

Group Vice President, Human Resources & Chief HR Officer, Ford Motor Company

## LEARNING AND DEVELOPMENT

**We believe that in our rapidly changing world, curiosity and continuous learning are critical. We provide a variety of learning opportunities throughout employees' careers to ensure their ongoing development – not only preparing our employees to react to change, but to capitalize on it, creating tomorrow and driving human progress.**

### The Workforce of the Future Is Here

Changes in technology – automation, robotics and artificial intelligence (AI) – create demands for new skills in the workplace. At Ford, manufacturing technicians are being trained in electrified vehicle diagnostics. Portable training cells integrate robots, controls and vision systems to provide system-level training in our manufacturing facilities.

#### Creating the Future

As well as responding to the changes needed to upskill our employees, we are protecting our ability to envision and create the future. Our engineers and technicians are complementing mechanical engineering skills with software engineering skills, ensuring we can move at the speed of software even as we continue to develop hardware.

We are also experimenting with applications of new technologies to enable continuous learning. Experiments include using augmented reality to assist in training and diagnostics, allowing technicians to see hidden components true to scale and in their correct location, teaching production operators through virtual representation and repetition, and using virtual reality to provide interactive maintenance training.

### Enabling a Culture of Curiosity

In an increasingly online world, with information at our fingertips, employees are taking ever-more ownership of their learning. We are providing employees with strategic options to build their capability through the latest learning approaches and partnerships with expert organizations. We provide access to Massive Open Online Courses (MOOCs) for fast-changing skills like software development, AI, robotics, machine learning and deep learning programs. Partnerships with world-class universities provide opportunities for state-of-the-art research, exploration, innovation, and technical and leadership skills development.

#### Learning Through Collaboration

Through leadership and professional development, employees can develop intrapersonal and interpersonal self-awareness skills, and appreciate differences in how we all think, act and work. Cohort-based program designs provide opportunities for peer collaboration, network building and creating a sense of community, shared values and culture across the company.

- **The Global Leadership Summit:** Aimed at executives and general managers responsible for global projects, departments and budgets
- **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 includes hands-on applications

Our employees can also build the capacity of others by sharing their subject-matter expertise, knowledge and insights in both technical and non-technical areas. This practice is embedded within leadership programs to provide skill-building opportunities to developing leaders. In our Asia Pacific region, for example, 62 mid-level leaders are certified to teach the Salaried Supervisor Institute program to front-line leaders in Thailand, Vietnam, India, China and Taiwan.

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## Case Study

### Collaborating on Robotics

Ford and the University of Michigan in Ann Arbor have begun development of the Ford Motor Company Robotics Building. As we progress toward becoming a major player in vehicle autonomy, more than 100 of our employees working on robotics and automation [will be relocated there](#).

Due to open in 2020, the new facility will host additional offices, classrooms, an open collaboration area and lab spaces set up for specific automation technologies. Plans also include a three-story flying zone for aerial vehicles, an outdoor obstacle course for walking robots, garage space for autonomous cars, and space to study prosthetics, exoskeletons and other medical- or rehabilitation-related applications of robotics.

Ford will also benefit from the facility's close proximity to the University's "[MCity](#)" [simulated urban environment](#) for autonomous vehicle testing, where we have tested our self-driving Ford Fusion prototypes for a number of years, and to the [American Center for Mobility](#) in the neighboring city of Ypsilanti.

*"The Ford Robotics Building presents an all-new way for us to work together – to create new opportunities, to innovate together. This is a place where the best and brightest from Ford Motor Company and the University of Michigan – students and professors – will be together. This will be an unprecedented working environment."*

#### Ken Washington

Vice President, Research and Advanced Engineering & Chief Technology Officer, Ford Motor Company

Related Pages:

- > [Unleashing the Best in Our People](#)
- > [Attraction and Retention](#)

## HUMAN RIGHTS

**Our products rely on the skills of thousands of our own employees, and many more in our supply chain. Ford is committed to respecting human rights everywhere we operate, and throughout our entire supply chain.**

### HOW WE'RE DRIVING CHANGE

#### Safeguarding Human Rights

Ford is committed to respecting human rights everywhere we operate, and throughout our entire supply chain. We aim to ensure that everything we make, or that is made for us by others, is consistent both with local law and with our commitment to protecting human rights.

We have conducted more than 40 human rights assessments, dating back to 2004, evaluating how our facilities around the world align with our Code of Human Rights, Basic Working Conditions and Corporate Responsibility ([Policy Letter 24](#)). The reports of assessments undertaken in the past three years are available for [download](#).

Our 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](#)
- > [Organization for Economic Co-operation and Development's Guidelines for Multinational Enterprises](#)
- > [United Nations' Global Compact Principles](#)

Our commitment requires a robust approach to safeguarding against human rights abuses in our supply chain, including:

- **Analyzing the human rights risks associated with our supply base**
- **Conducting training to build our suppliers' capability**
- **Auditing our Tier 1 suppliers in high-priority locations**
- **Collaborating with others in multi-stakeholder initiatives and partnerships**

### OUR PERFORMANCE

#### Protecting Human Rights

We remain committed to respecting and protecting human rights everywhere that we operate, in our operations and our supply chain.

- **Nine most important human rights issues** covering both Ford and our business relationships identified through a detailed assessment
- **10 training sessions** held on human rights, working conditions, business ethics and the environment
- **International Framework Agreement** established, confirming our commitments to the global labor community
- Training covered delegates from **203 supplier sites**

## TARGETING OUR HUMAN RIGHTS ACTIVITIES

**We have clear, established commitments to human rights throughout our global operations. By identifying and prioritizing the issues that can have the most impact on our business, we can better target our activities to promote human rights and achieve greater results.**

### Our International Framework Agreement on Human Rights

We believe that our most important asset is our diverse group of men and women. In addition to the policies and procedures we have in place to protect our employees, and our corporate commitment to human rights, we also have an International Framework Agreement (IFA) that reiterates our commitments to our global labor community. The principles outlined in our framework agreement are based on labor standards espoused by various groups, institutions and documents, such as the [UN Universal Declaration of Human Rights](#) and the Global Sullivan Principles of Social Responsibility.

Related Pages:

- > [Collaborating for Human Rights](#)

#### Our International Framework Agreement Human Rights Principles

- We respect employees' right to freedom of association and to collectively bargain
- We do not tolerate harassment or unfair discrimination
- We will not use forced/compulsory or child labor
- We provide compensation and benefits as well as work and vacation hours that are competitive and comply with applicable laws
- Ford will provide a safe and healthy working environment that meets or exceeds applicable standards for [health and safety](#)
- We promote and support appropriate education, training and development
- We respect the natural environment and want to help preserve it for future generations by working to provide environmental solutions and avoid waste
- Ford will be honest, open and transparent and model the highest standards of corporate integrity
- We encourage business partners and suppliers to adopt and enforce similar policies to those outlined in the above principles

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## Being Accountable

We are committed to the principles outlined in our framework agreement and we ensure ongoing compliance through open dialogue with our union partners and an annual Global Information Sharing Forum. The forum is a joint company and union session where our union leaders from around the world and senior leadership meet to discuss the industry, our business and any issues on compliance with the above principles. Where issues are identified, the company and the applicable union work together to find solutions. We also have an escalation process in place to address critical issues as they arise.

Related Page:

> [Responsible Sourcing of Raw Materials](#)

## Identifying Our Most Important Human Rights Issues

We conducted a formal human rights saliency assessment in 2018. Conducted in line with the [UN Guiding Principles Reporting Framework](#), the assessment served to identify Ford's most important human rights issues – those at risk of the most severe negative impact through the company's activities and business relationships.

The assessment was conducted in partnership with third-party consultancy and included:

- **Desk-based research** covering a review of Ford's relevant internal documentation, peer review and media scan, and identifying a long list of potential issues
- **Interviews** with internal representatives from across Ford's business as well as external stakeholders including suppliers, investor representatives, NGOs and industry experts, to review and rate the identified issues in terms of their severity and likelihood for negative impact on rights holders through Ford's activities or business relationships
- A **workshop** to validate and confirm the assessment findings with internal and external stakeholders

The assessment identified our nine most important human rights issues, listed below in ranked order:

### Product Safety and Quality

Products are designed using standards which ensure they meet or exceed all applicable laws and regulations and ensure that they do not represent harm or hazards to consumers. Ford's products will advance the state-of-the-art safety wherever practicable. [Find out more about product safety and quality.](#)

### Harassment and Discrimination

Harassment and discrimination are zero-tolerance issues. Harassment or discrimination on the basis of gender, race, color, religion, age, national origin, sexual orientation, gender identity, disability or veteran status are not tolerated at Ford. [Read more about how we build diversity and inclusion.](#)

### Responsible Sourcing of Raw Materials

Responsible sourcing of raw materials ensures that materials are never knowingly procured that contribute to human rights abuses, including child and forced labor; bribery or corruption; or environmental concerns. Responsible sourcing expectations include compliance with local law, reporting requirements (i.e., conflict minerals such as cobalt and mica, 3TG reporting), customer terms and conditions, and respect for indigenous populations, including water and land rights. [Find out more about our responsible sourcing.](#)

### Health and Safety

Health and safety pertains to providing and maintaining for all personnel a safe and healthy work environment that meets or exceeds applicable legal standards for occupational health and safety. [Find out more about our commitment to health and safety.](#)

## Climate Change

We acknowledge that climate change is real and that we share the responsibility for reducing greenhouse gas (GHG) emissions. Climate change impacts include extreme weather events and natural disasters, rising sea levels, floods, heatwaves, droughts, desertification, water shortages, impact on oceans and the spread of tropical and vector-borne diseases. [Find out more about our activities to help mitigate climate change.](#)

### Air Quality

Poor air quality and air pollution can impact negatively on human health, resulting in allergies and diseases, and affect the human right to life. [Read more about air quality.](#)

### Access to Water and Sanitation

The human right to water entitles everyone to sufficient, safe, acceptable, physically accessible, and affordable water for personal and domestic (household) use.

“Sanitation” is defined as a system for the collection, transport, treatment, disposal, or reuse of human excreta and associated hygiene. The human right to sanitation entitles everyone to sanitation services that are safe, socially and culturally acceptable, secure, hygienic, physically accessible and affordable, and that provide privacy and ensure dignity. [Find out more about our work to promote access to water and sanitation.](#)

### Forced Labor

Forced or compulsory labor refers to all work or service by an individual in which they are coerced to work through the use of violence or intimidation, or by more subtle means such as accumulated debt, retention of identity papers or threats of denunciation to immigration authorities. [Find out about how we safeguard against forced labor.](#)

### Child Labor

Child labor relates to the prohibition of employment of individuals who are under the minimum working age of 15 or the legal limit in the working country (whichever is stricter). Child labor also relates to inadequate systems and policies to prevent the use of underage workers, either directly or indirectly through labor agencies and contractors. Excludes child labor in raw materials mining, which is covered under responsible sourcing of materials. [Find out about how we safeguard against child labor.](#)

## What Happens Next?

Having identified the most important issues, over the next 12 months we will demonstrate leadership on addressing and reporting on these issues by implementing a comprehensive series of actions.

We will develop action plans to manage and remediate issues, ensure we have the right mechanisms in place to track the effectiveness of our systems and performance, and review and update our human rights policy. We will also establish an annual review process of our most important issues.

We will provide disclosure on the most important identified issues with external communications and reporting, including our annual sustainability report and the UN Guiding Principles Reporting Framework Index.

Strategy and  
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## 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 legislative initiatives, acts and regulations designed to increase supply chain transparency. These legislative initiatives include the California Transparency in Supply Chains Act of 2010 (SB657) and the U.K. Modern Slavery Act (UK-MSA).

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](#).

### *Salient Issue*

#### Forced Labor and Child Labor

During our first formal human rights saliency assessment, we identified forced labor and child labor as two of our nine most important issues – those at risk of the most severe negative impact through Ford's activities and business relationships.

Going forward, we're taking steps to develop action plans to manage and remediate these issues, and to expand our reporting on them.

> [Find out more about our human rights saliency assessment](#)

#### Ethical Recruiting

In 2016, we reviewed our internal policies and procedures to ensure that they align with the fundamental tenets of ethical recruiting. In 2017, we formalized our ethical recruiting expectations for suppliers in our Supplier Social Responsibility and Anti-Corruption Requirements web-guides. These requirements include that suppliers do not:

- Destroy, conceal 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

Related Pages:

- > [Building Capacity in Our Supply Chain](#)
- > [Auditing Our Suppliers](#)
- > [Transparency Throughout the Supply Chain](#)

## COLLABORATING FOR HUMAN RIGHTS

**Ford collaborates with all our stakeholders, including NGOs and investors, and member-driven organizations such as Ceres, SustainAbility and the World Business Council for Sustainable Development, to combat human rights violations. We believe that sector-wide forums are also vital for providing a common voice and driving change within our industry.**

### Collective Action on How We're Working With Others

We currently participate in the following organizations and initiatives:

- **Automotive Industry Action Group (AIAG):** Ford is a member of the Corporate Responsibility Steering Committee and the AIAG Board of Directors. We also co-chair the AIAG's Supply Chain Sustainability Committee, which works to increase supplier capability for managing human rights and working conditions in the sector.

- **Drive Sustainability (The Automotive Partnership: Drive Sustainability):** This partnership of 10 automotive OEMs has a commitment to move to the next level of sustainability and supply chain management in the automotive industry. The partnership, launched in 2017 and facilitated by CSR Europe, builds on the work of the European Automotive Working Group, of which Ford was an active participant.
- **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.
- **Responsible Business Alliance (RBA):** Ford was the first automotive manufacturer to join the RBA (formerly known as the Electronic Industry Citizenship Coalition), 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 RBA Board of Directors and is an active participant in the Responsible Labor Initiative, the RBA Validated Audit Process workgroup, and the RBA Tools workgroup.

In 2017, AIAG and Drive Sustainability expanded the [Automotive Industry Guiding Principles to Enhance Sustainability Performance in the Supply Chain](#). AIAG and Drive Sustainability also launched the newly established [Practical Guidance Documents](#).

Related Pages:

- > [Targeting Our Human Rights Activities](#)
- > [Building Capacity in Our Supply Chain](#)
- > [Auditing Our Suppliers](#)
- > [Responsible Sourcing of Raw Materials](#)

## BUILDING CAPACITY IN OUR SUPPLY CHAIN

**Our work to address human rights issues goes beyond our direct operations and extends through our entire supply chain. Training on human rights issues is essential to help our suppliers build their capability to responsibly manage working conditions in their facilities.**

### Prioritizing Our Efforts With Suppliers

Due to the size and complexity of our supply base, we focus our efforts on suppliers located in countries that pose the highest risk for substandard working conditions. To determine these 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 2017.

### 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

Related Page:

> [Targeting Our Human Rights Activities](#)

### Expanding Our Reach

In late 2017, we asked over 500 supplier sites around the world to complete the Sustainability Self-Assessment Questionnaire (SAQ) developed by Drive Sustainability. The SAQ is designed to assess the sustainability performance of automotive suppliers in the areas of social and environmental sustainability, business conduct and compliance and supplier management. This tool is based upon the Global Automotive Sustainability Guiding Principles and allows suppliers to share their responses with multiple customers. The data gathered in our 2017 campaign will be considered in conjunction with our internal/external risk analysis to prioritize our activities for 2018.

Related Pages:

> [Auditing Our Suppliers](#)

### How We Build Capability

Our approach to training has been developed and launched through the Automotive Industry Action Group (AIAG). This involves:

- An **e-learning** module introducing the concepts covered by the [Automotive Industry Guiding Principles](#), and a **knowledge assessment** to provide feedback. Training materials are available free of charge to original equipment manufacturers (OEMs) and to sub-tier suppliers in seven languages.
- **Face-to-face, in-country workshop sessions**, customized for the unique conditions in each country and focusing on specific national laws and local best practice. These sessions encourage dialogue with suppliers for multiple OEMs. They emphasize the role of human rights in meeting legal obligations, industry guidelines and international best practice. Ford requires participants 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 Drive Sustainability. Materials are regularly shared with Drive Sustainability to ensure a consistent message across the industry. These materials also serve as the basis for our own Ford-specific workshops.

Related Page:

> [Collaborating for Human Rights](#)

### Training Results

In 2017, the AIAG e-learning module reached more than 1,900 participants, with 42 percent indicating Ford as a customer. During the year, supplier representatives from 203 direct and indirect supplier sites in five countries (Brazil, China, India, Thailand and Turkey) attended in-country training sessions covering human rights, working conditions, business ethics and the environment.

|  | 2015 | 2016 | 2017 | Program Total <sup>1</sup> |
|--|------|------|------|----------------------------|
| Training sessions conducted                | 12   | 14   | 10   | 185                        |
| Total sites trained/retrained <sup>1</sup> | 208  | 161  | 203  | 3,549                      |

Data notes and analysis:

1. Program Total represents cumulative data from 2003 to 2017.

Also see:

> [Data: Working Conditions Training and Assessment](#)

We also continue to strengthen our own internal capability for identifying and managing human rights issues. In 2017, we trained 1,518 Ford Purchasing employees, including management and supplier quality teams, on our Policy Letter 24 and Supply Chain Sustainability Program. The training focus is to identify and report warning indicators for any potential human rights violations observed in any supplier location around the world. Since 2014, we have trained or retrained 3,968 Supplier Technical Assistance (STA) personnel.

### Case Study

#### Driving a Better Tomorrow

Through winning the hearts and minds of our purchasing community, we empower our buyers to make more sustainable sourcing decisions. Driving a Better Tomorrow is a purchasing series created to educate and inspire employees on supply chain sustainability hot topics, trends or best practices. External industry experts are invited to share their perspectives and insights on key areas of interest. This program supports Ford's journey to drive sustainability integration; as a company, we must ensure that sustainability is part of all key processes and decisions we make.

In May 2018, over 400 buyers participated in a live session on business ethics, responsible sourcing and human trafficking. Industry experts and NGO thought leaders shared how the purchasing organization is impacted by these issues and, more importantly, the role purchasing can play in driving change.

**As a company, we must ensure that sustainability is part of all key processes and decisions we make.**

Related Page:

> [Reducing Our Collective Footprint](#)

### 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 necessary to drive sustained supplier improvement.**

#### A New Protocol

Ford has been conducting third-party external supplier audits since 2003. We have conducted over 1,075 supplier audits and more than 1,400 follow-up assessments around the world and across commodities.

Recognizing the value in cross-industry collaboration and adoption of best practices, in 2016 we became the first automaker to join the Responsible Business Alliance (RBA) (formerly the Electronics Industry Citizenship Coalition). As part of our membership, we adopted the Validated Audit Protocol (VAP). This audit protocol provides an expanded scope, with 90 questions covering labor, health and safety, management systems, ethics and the environment. Validated audits are conducted utilizing independent external auditors and include third-party quality control and validation to ensure credibility. Our audits are generally announced and agreed with the supplier in advance.

In 2017, we conducted 27 new audits using the VAP methodology, 100 percent of which were externally validated and certified by the RBA. The audits covered a broad range of commodity groupings from all regions of the world and were identified according to our risk assessment process.

Both Ford and our suppliers have experienced a learning curve associated with the elevated standards and process discipline required by the RBA audit protocol. To assist in process adherence, we implemented a number of improvements to our supplier engagement approach between 2016 and 2017:

- All audits were conducted according to the latest VAP audit protocol (V5.1.1)
- To prepare for the audit, suppliers completed the RBA SAQ in advance of the audit
- Supplier subject matter experts (Health and Safety, Plant Manager, HR Manager) were asked to participate in an RBA-facilitated, targeted onboarding meeting
- Suppliers were assigned three RBA Learning Academy e-learning modules to prepare them for the audit
- Suppliers interfaced directly with the third-party Audit Quality Manager to ensure direct feedback on priority non-conformance corrective action plans according to the RBA timeline

Through this direct engagement, our 2016 auditees (the most recent data available) improved their raw audit score by an average of 45 points between the initial and the closure audits, reinforcing supplier commitment to improving working conditions.

Related Pages:

- > [Collaborating for Human Rights](#)
- > [Building Capacity in Our Supply Chain](#)

### Recognizing Our Commitment

The RBA has established the VAP recognition program to recognize a factory's commitment to social and environmental responsibility. Five of our suppliers from the Asia Pacific region are eligible for recognition through the VAP recognition program: two at the platinum level and three at the silver level.

### Third-Party RBA Social Responsibility Audits: Assessment Results<sup>1</sup>

|                       | 2016 | 2017       | Total to Date <sup>2</sup> |
|-----------------------|------|------------|----------------------------|
| Initial assessments   | 31   | 27         | 58                         |
| Follow-up assessments |      | 2016<br>NA | 2017<br>24                 |

Data notes and analysis:

1. Audits conducted using the Responsible Business Alliance VAP Audit.
2. Program Total represents cumulative data from 2016 to 2017.

## Taking Corrective Action

For identified non-conformances, we expect all of our suppliers to develop a corrective action plan detailing root causes, planned remediation actions and timings for resolution. Such plans are regularly reviewed with in-region supply chain sustainability personnel to ensure compliance aligned with Ford's expectations. We also review the overall status of supplier compliance with our commodity purchasing teams.

The most serious non-conformances identified are termed priority non-conformances. For these items, the supplier is required to prepare immediate containment plans and longer-term corrective action plans, which are reviewed and monitored by Ford regional sustainability leads. 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.

We had one instance in 2017 of a supplier being placed on sourcing hold as a result of 2016 audit results that uncovered fees being charged to foreign workers. While the fees being charged were allowed by local law, they were not aligned with our newly launched expectations regarding "no fees." The supplier is in the process of implementing corrective actions. We will continue to follow up and ensure that the situation has been remediated prior to new business being awarded to that supplier.

## Audit Findings

### 2017 Non-Conformances Identified in RBA Audit

|                    | % of total |
|--------------------|------------|
| Environment        | 11         |
| Ethics             | 8          |
| Health and Safety  | 25         |
| Labor              | 33         |
| Management Systems | 23         |

The majority of non-conformances identified in our 2017 RBA audits were in the labor and health and safety sections. The weighting of issues in 2017 is aligned with 2016 audit data. There was an overall decrease of 17 percent in the total number of non-conformances between 2016 and 2017.

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

- 39 percent were attributable to working hours and consecutive days of work
- 47 percent were health and safety issues
- 3 percent were environmental issues

The remaining non-conformances were labor items, including pregnancy testing as a condition of employment, nighttime work for young workers and applicant-paid health checks.

Beginning in 2017, we began to direct all of our suppliers with identified priority non-conformances to targeted e-learning modules offered by the RBA. These specific modules are intended to provide additional capability building within the supply base.

## Frequent Non-Conformances in 2017

### Labor

Non-conformances related to working hour requirements – including inadequate time off and lack of policies and systems to record and manage working hours – continue to be frequently identified in supplier audits.

Our audits did not reveal any instances of child labor or forced or involuntary labor, although a number of our suppliers' policies/procedures lacked the required robustness to ensure compliance.

Our audits also found that many suppliers lack the policies and procedures to ensure reasonable accommodation for all religious practices.

We continue to expand our training efforts and capacity building to equip suppliers with the knowledge, skills and processes to ensure employees' rights are protected.

### Health and Safety

The most frequent health and safety non-conformances identified in 2017 audits were related to emergency preparedness. Many of these non-conformances can be quickly resolved through minor actions such as more frequent fire drills and updated emergency indicators and signage. Some, though, require more complex planning to resolve them.

A number of audits revealed that some suppliers do not keep all required permits, licenses and test reports as required by local law. It was also uncovered in some instances that further discipline is required to ensure adequate personnel training on first aid equipment and more regular certification of first aid equipment. These issues are generally resolved quickly upon discovery.

### Environment

Improper chemical container labeling and lack of secondary chemical containment are easily remediated non-conformances with hazardous substances. Identified gaps in management processes and lack of adequate worker training may require additional time to resolve.

A number of supplier sites were found to lack proper storm-water management processes, which are necessary to protect local waterways from contamination. These suppliers have been asked to develop corrective action plans to prevent discharges and spills from entering storm drains. As the RBA expectations are cascaded through our supply chain, we expect non-conformances in storm-water management to decrease.

Incomplete energy or greenhouse gas emissions data are flagged as non-conformances to the RBA audit protocol. For these, we continue to work with our suppliers through the [CDP Supply Chain](#) and [Ford PACE programs](#), providing technical support and best-practice ideas to improve supplier reporting transparency and performance in energy management.

### Ethics

Ethics non-conformances represent the smallest number of non-conformances identified in our supplier audits. Most identified items relate to the lack of effective policies and procedures to combat these issues. No instances of retaliation or bribery or corruption were found. Ethics compliance has gained greater visibility in the automotive industry, resulting in enhanced language in the [Automotive Industry Guiding Principles to Enhance Sustainability Performance in the Supply Chain and the associated newly established Industry Practical Guidance](#). Industry training sessions will be updated to reflect this added emphasis.

### Management Systems

Many of our suppliers lack mature and comprehensive management systems to proactively identify Labor, Health and Safety, Environment and Ethics risks. Specific items found include improperly defined roles regarding social compliance issues and lack of routine review of managements' handling of these issues. Many of our supplier facilities do not conduct regular self-audits to assess conformance with social compliance standards and regulations.

We have found that our [Aligned Business Framework \(ABF\)](#) suppliers have performed consistently better in this area than our non-ABF suppliers. Ford is exploring ways to extend the ABF approach to a broader section of the supply base.

Related Pages:

- > [Targeting Our Human Rights Activities](#)
- > [Data: Working Conditions Training and Assessment](#)
- > [Responsible Sourcing of Raw Materials](#)

## RESPONSIBLE SOURCING OF RAW MATERIALS

**With approximately 1,200 Tier 1 production suppliers providing up to 40,000 parts per vehicle, and 1,000 different materials in those parts, Ford recognizes that our material supply chain is complex. Nevertheless, we are committed to ensuring that the materials that go into our vehicles have been sourced responsibly.**

Ford is working on multiple initiatives to increase transparency and responsibility in raw material sourcing because we recognize the importance of raw materials in the automotive supply chain. Ford participates in studies, workgroups and both industry and cross-industry collaborative discussions to identify key ethical, environmental and labor issues impacting the raw material supply chain.

We conduct ongoing investigations of raw materials to determine the appropriate level of action that must be taken internally and externally with the supply base. As we identify materials of concern, such as tin, tantalum, tungsten, gold, cobalt, mica, rubber and others, suppliers may be requested to support initiatives to improve due diligence and increase transparency. They may also be requested to provide information to verify that the materials in the products supplied to Ford have been sourced responsibly.

### Salient Issue

#### Responsible Sourcing of Raw Materials

During our first formal human rights saliency assessment, we identified sourcing of raw materials as one of our nine most important issues – those at risk of the most severe negative impact through Ford's activities and business relationships.

Going forward, we're taking steps to develop action plans to manage and remediate these issues, and to expand our reporting on them.

- > [Find out more about our human rights saliency assessment](#)

#### 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 responsibly sourced 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 sourced responsibly.

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

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## 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 U.S. Dodd-Frank Act 2010,<sup>1</sup> 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. Ford's Conflict Minerals Report was ranked as the highest-scoring by any auto manufacturer in the Mining the Disclosures 2017 report produced by the 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. We encourage suppliers 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. Ford requests its suppliers obtain 3TG from smelters that have been validated as conformant to a third-party responsible minerals sourcing validation program.

## Reporting Progress

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

In 2018, we will continue to work with our suppliers to improve the quality of their reports.

Read our [2017 Conflict Minerals Disclosure filing](#) and download our [Conflict Minerals Policy](#) for more information.

## 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 Responsible Minerals Initiative (RMI)-conformant smelters
- Participate in smelter outreach efforts to encourage participation in the RMI audit process

## Going Beyond Conflict Minerals

As our vehicle technologies and part designs continue to change, so will the materials we require in our products. Through Ford's ongoing raw material investigations and collaborative workgroups, we work hard to identify materials of concern that fall outside the U.S. Dodd-Frank Conflict Minerals legislation. Through enhanced contractual requirements, reporting requests and transparent dialogue, we work with our suppliers to ensure the raw materials that end up in our products have been sourced ethically and responsibly.

Some of the actions Ford has undertaken to improve sustainability in the raw material supply chain, beyond conflict minerals, are as follows:

- Enhance the Ford Motor Company Supplier Social Responsibility and Anti-Corruption Requirements Web Guide to expand responsible sourcing requirements for suppliers from conflict minerals to conflict minerals and additional materials of concern
- Increase buyer awareness for materials of concern and highlight the ways in which buyers sourcing parts with materials of concern can have a positive impact. At a special purchasing event, a vice president from the Responsible Business Alliance's RMI initiative stressed

the importance of responsible mineral sourcing, including key concerns and opportunities, due diligence expectations and recent engagements with investors and NGOs. [Find out more about how we are embedding sustainable sourcing decisions](#)

- Participate in RMI, AIAG and Drive Sustainability multi-stakeholder initiatives

## Cobalt

- Ford is participating in the RMI cobalt pilot project. We are surveying relevant suppliers to gain a better understanding of the source and due diligence practices associated with the cobalt in our products
- A supplemental request for quotation (RFQ) section has been added for all future battery products. The supplement includes several due diligence questions specific to cobalt, to ensure that potential suppliers understand the importance of responsible cobalt supply and the compliance required of them before sourcing is awarded
- Supplier meetings are conducted with leading battery suppliers to increase transparency in the supply chain and ensure sustainable and ethical practices are supported in the product supplied to Ford

## Mica

- Supplier meetings are conducted with key coating suppliers to monitor their performance and due diligence to source mica responsibly
- Mica due diligence activities include mapping the supply chain with Tier 1 suppliers, reviewing third-party audits of mica mines and participating in cross-industry investigations on mica

## Rubber

- Ford is participating in new multi-stakeholder initiatives focused on increasing the supply chain for sustainable natural rubber
- Contributions to third-party consultant research were provided to understand the needs for sustainable natural rubber in the automotive industry and requirements for tire manufacturers
- We continue to work with OEMs, tire manufacturers, civil society and consultants to encourage and structure a sustainable rubber framework for the automotive supply chain

## 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:

- In recognition of our efforts, Ford was included in the Top 100 Conflict Minerals Influence Leaders by Assent in 2017 for the third consecutive year
- [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
- [Responsible Minerals Initiative \(RMI\)](#) – Ford is a member of the RMI Steering Committee and an active member of the RMI Smelter Engagement Team (SET). In addition, Ford is a member of the RMI Multi-Stakeholder Group and the RMI Due Diligence Practice team
- [Public-Private Alliance for Responsible Minerals Trade \(PPA\)](#) – Ford is an active member of the PPA, contributing to in-region solutions for responsibly sourced minerals

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

Related Pages:

- > [Targeting Our Human Rights Activities](#)
- > [Collaborating for Human Rights](#)
- > [Using Sustainable Materials](#)

Strategy and Governance

Customers and Products

Operations

People and Society

Performance and Data

## GLOBAL MOBILITY

The world is becoming more crowded and urbanized, air quality is a global issue, and consumer preferences are changing rapidly. However, the new digital age is bringing exciting opportunities for potential solutions, which Ford is helping to drive. Ford's Mobility plan is using technology and innovation to address these global trends and to make people's lives better.

### HOW WE'RE DRIVING CHANGE

#### Changing the Way the World Moves

Ford Motor Company was built on the belief that freedom of movement drives human progress. It's a belief that has always fueled our passion to create great cars and trucks. And today, it drives our commitment to become the world's most trusted mobility company, designing smart vehicles for a smart world that help people move more safely, confidently and freely.

#### A Fast-Moving World



##### Crowded Cities, 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

#### Core Growth, Emerging Opportunities

Emerging opportunities in mobility are a substantial potential growth area and a strategic priority for Ford. The traditional business model no longer applies, and there are significant organizational challenges and opportunities for Ford as we develop 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. We know there will be winners and losers emerging from the disruptive, dynamic mobility space. Knowing where to play and how to win is key.

We aim to lead in connectivity, autonomous vehicles, data analytics, the customer experience and mobility – we call our plan for this Ford Smart 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.

We've identified three key areas of opportunity where we can lead:



##### Electrification

Become a top player in electrified solutions



##### Autonomy

Lead the development and application of fully autonomous vehicle technology



##### Mobility

Develop services and business models

### OUR PERFORMANCE

#### Helping the World Move Smarter

We're using our technology and know-how to bring to life our vision of the future, with smarter forms of mobility operating within more sustainable cities.

- **\$11 billion** investment in electrified vehicles
- **10 years'** leadership in autonomous vehicle technology development
- **40** new electrified vehicles to come globally by 2022
- **90%** of new Ford vehicles to be connected by 2020

## SELF-DRIVING VEHICLES

**Self-driving vehicles have transformative potential. Ford has been a leading player in self-driving vehicle technology development for more than 10 years and we're working with key partners to incubate ideas and accelerate solutions.**

#### Going Driverless

Self-driving vehicles offer many ways in which we can change how our cities work for the better. We believe they offer safer, more efficient, more widespread solutions that benefit cities, companies and individuals. That's why we're working with partners such as Domino's, Lyft and Postmates to develop pilot projects using self-driving vehicles. We're also working to ensure these vehicles are safe and reliable, and to gauge public reaction to this new technology. Our target is to begin production by 2021 of a purpose-built, self-driving vehicle so we can enable mobility services at scale.

### Case Study

#### Testing Self-Driving Vehicles for Food Delivery

**With a target of beginning production of self-driving vehicles in 2021, we are designing a business to meet the needs both of partner companies and of their customers.**

Ford is partnering with Domino's Pizza to find out how customers react to self-driving vehicles delivering their meals. Teams from the two companies will gauge consumers' views, providing invaluable insights to inform any future use of self-driving vehicles in food delivery.

During the trial, randomly selected Domino's customers in Ann Arbor, Michigan, will have the opportunity to receive their pizza delivery order from a Ford Fusion Hybrid Autonomous Research Vehicle. The vehicles will be manually driven by a Ford safety engineer and staffed with researchers. Customers who agree to take part will be able to track the delivery vehicle's progress via an upgraded version of Domino's Tracker®. Text messages will keep them informed on how to retrieve their pizza and send them a unique code to unlock the Domino's Heatwave Compartment™ inside the vehicle.

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As we continue to develop self-driving technology, research like this is crucial in ensuring that technology is used in ways that enhance the customer experience. With a target of beginning production of self-driving vehicles in 2021, we are designing a business to meet the needs both of partner companies and of their customers.

Related Page:

> [Smart Vehicles for a Smart World](#)

## MOBILITY SOLUTIONS

**Transportation is undergoing perhaps the greatest revolution in a century. Ford is itself expanding to become a leader in both automotive and mobility, helping to create a better, smarter world.**

Companies everywhere talk a lot about mobility, connectivity and finding ways to make better use of data. At Ford, we have been working on this for a long time and we have entered into partnerships or acquisitions of companies such as Autonomic and TransLoc who are renowned in this space. We are also working very closely with cities to ensure that we're providing mobility solutions that will benefit the city and improve the way its citizens move around it.

We are focusing on two core elements that underpin everything we're doing – delivering a human-centric experience, and building on the foundation of trust the Ford brand already has.

You've heard us say we're building smart vehicles for a smart world. Taking a human-centric approach to this means we aren't just introducing technology for the sake of having the latest know-how. We're focusing on the experiences we can create for our owners and users and how they need to move, and we're creating and using technology to deliver those experiences.

To build trust, we are building on our reputation and focusing on privacy and security. Our owners and users need to know they can trust us with the data they choose to share with us; building that trust and ensuring we deliver on that promise underpins everything we are doing.

We are accelerating and expanding our activities to deliver a broad suite of mobility products and services, for individual car owners right through to entire cities. An increase in speed and scale will come through the establishment of four new, integrated teams:

- **Ford X:** Offering quick incubation of potential products and services; and new mobility businesses early in their development
- **Mobility Business Group:** Responsible for scaling the company's existing mobility businesses
- **Mobility Platforms and Products:** Leading design and development for the technology underpinning Ford's mobility businesses
- **Mobility Marketing and Growth:** Driving demand with individual consumers and with commercial and city customers, and ensuring the voice of the customer is heard throughout the organization

## Case Study

### Bringing Mobility Solutions Closer

**We aim to create and incubate new mobility businesses, as well as dynamic routing solutions that help cities and motorists globally.**

As part of the acceleration of our mobility solutions, we have acquired [Autonomic](#), a technology company that specializes in scale, architecture and leverage for transportation solutions, and [TransLoc](#), a provider of demand-response technology for city-owned microtransit solutions.

Our acquisition of Autonomic will hasten the establishment of our Transportation Mobility Cloud platform and support other key mobility initiatives. Autonomic will also help us create and incubate new mobility businesses and help us access top technology talent.

TransLoc will enable us to leverage the company's operational expertise and network of city relationships, as well as its dynamic routing solutions that have helped cities and motorists globally.

In addition, in 2017 we founded Ford Commercial Solution. This new business arm will leverage vehicle connectivity to deliver data services and fleet optimization to the commercial sector.

## Transforming the Customer Experience

Through FordPass, we are focused on taking the consumer experience to the next level and transforming how consumers interact with Ford. Helping people travel in a smarter way, FordPass features include:

- Live traffic delivering real-time service updates to help avoid congestion
- In-app service booking
- Ford credit account management
- FordGuides to help with any FordPass questions
- Find parking locations and prices with FordPass partner NCP

The new FordPass Connect, the embedded modem technology, will add additional features such as remote lock or unlock, vehicle location and automatic vehicle health alerts. The FordPass app is available to download for free now in both the Apple and Google app stores.

We have continued to add new and enhanced functionality to the FordPass app and services over the year. FordPass members can now find a parking spot more easily, with the added ability to make reservations as well as see parking garages.

## Case Study

### Chariot Rides Into London to Help Commuters

*"Cities globally are dealing with increased congestion and environmental issues. Ford is helping to alleviate these challenges by developing mobility solutions – such as Chariot – that are finely tuned to the unique challenges of commuters in different locations, addressing gaps in transport systems and completing their travel with first- and last-mile additions."*

**Marcy Klevorn**  
President, Ford Mobility

Following its successful introduction in the United States, Ford's commuter shuttle service Chariot has launched in London. Designed for city dwellers who may not have easily accessible public transport, Chariot helps them to complete the first and last miles of their journeys more easily by connecting them with underground stations and other transport hubs.

After a detailed analysis of urban areas, four London routes have been identified to connect commuters in densely populated and rapidly growing areas to existing transport networks. A fleet of 14 fuel-efficient minibuses will operate up to six shuttles per hour at peak times, offering Wi-Fi, air conditioning and overhead storage. Commuters can use a smartphone app to track progress, search for local routes and locate the nearest convenient pickup point before booking a seat.

Chariot is also exploring enterprise and charter services in London, and all drivers will be trained in supporting passengers with special needs.

As well as launching Chariot, Ford is trialing a 20-strong fleet of plug-in hybrid Transit Custom vans throughout 2018, as part of the "Cleaner Air for London" initiative run by the city's transport authority, Transport for London.

## Case Study

### GoRide Means No More Missed Appointments

*“By merging our expertise in vehicles, technology and human-centered design, we’ve created a high-touch, patient-focused service that truly understands and is tailored to patients and their needs. Our service is focused on multiple social determinants of health, and delivers the quality of care and on-time certainty that medical facilities need in order to increase throughput and reduce wait times.”*

**Marion Harris**  
Vice President, Ford Mobility Business Group

In 2017, Ford launched GoRide, a non-emergency medical transportation service to get patients safely to and from medical appointments on time.

GoRide sets new standards, offering a bedside-to-bedside service from professionally trained drivers, an on-demand wheelchair service and fully kitted-out transportation vehicles. As well as guaranteeing on-time arrivals and departures, GoRide also enables users to get to appointments they might otherwise not be able to get to because of a lack of their own transport, mobility challenges or even due to adverse weather conditions.

GoRide currently covers more than 200 health care facilities in the Beaumont Health Network, Southeast Michigan. Health care facilities can easily schedule and book transportations for their patients.

As well as helping patients, the system could also benefit the health care facilities. Missed appointments and scheduling issues cost the health care industry an estimated \$150 billion a year. Non-emergency medical transportation systems like Ford’s GoRide can help address this by getting patients to appointments on time and home faster after discharges, reducing readmission rates and the need for emergency services, and preventing missed medical appointments. And, with an aging population, there is a growing need for services like GoRide.

Related Page:

> [Building the City of Tomorrow](#)

## ENABLING SMART CITIES

**The future of city transport is intelligent movement. To make room for an ever-expanding population, we are searching today for the solutions and platforms that will make tomorrow viable.**

We are aggressively expanding core cellular-based connectivity across the Ford lineup with 100 percent of new vehicles in the U.S. and China connected by 2019 and over 90 percent of new global vehicles connected by 2020.

### Smart Solutions for Cities

In 2017, we opened our Mobility Innovation Office in London. The Here East office will target the near-term development of mobility technologies with a focus on the specific requirements of European cities. We will continue to work on projects with the city to help improve air quality, ease congestion and broaden mobility for Londoners.

The Here East campus is already home to Loughborough University, one of our longstanding research partners, and the Advanced Propulsion Centre, which has supported our powertrain research, including recent developments for this year’s plug-in hybrid Transit.

## Helping Drivers to Outsmart Traffic

In May 2018, we announced that the popular navigation and traffic app Waze will be available to Ford owners globally. With more than 100 million active users, Waze is the world’s largest community-based navigation app. The collaboration means that Apple iPhone owners will be able to project Waze to the big screen in their car. Ford already offers mobile navigation app [Sygic](#) on the AppLink platform, and the SYNC 3 Navigation System with FordPass Live Traffic.

*“Waze works as a personal heads-up from 100 million of your friends on the road – and now that will include the many Ford drivers who will be able to safely access our app while on the move through the car display.”*

**Jens Baron**  
Product Lead, In-Car Applications, Waze

### Connected Travel

Today, we spend an average of 38 hours a year in traffic; 30 years ago, it was 16. Growing urbanization brings increasing congestion – without solutions.

Ford’s [Transportation Mobility Cloud](#) is an open software platform that, among other things, could one day allow vehicles, streets and cities to talk to each other and plan the most efficient routes for people. This cloud technology could direct people to use a combination of an autonomously driven Ford-built taxi and bicycles to get to their destination. In the future, Ford customers may not even be car drivers at all.

*“We believe transportation done right – as part of a systems approach – can bring life back to our cities.”*

**Marcy Klevorn**  
President, Ford Mobility

Related Page:

> [Building the City of Tomorrow](#)

## OUR CONTRIBUTION TO SOCIETY

**Ford Motor Company has always been much more than just an employer – we’re also a neighbor. From investing globally in talent for the future to advancing sustainable communities, we aim to make a positive impact on society.**

### HOW WE’RE DRIVING CHANGE

#### Investment and Engagement

Our support for the communities in which we operate and for wider society 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.

We’re driving change across three key areas:



**Community Life**  
Advancing sustainable communities around the world



**Education**  
Building a talent pipeline for tomorrow



**Driver Safety**  
Encouraging safer driving globally

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## Ford Fund: Coordinating Our Impact on Society

The Ford Motor Company Fund and Community Services – or Ford Fund for short – oversees and coordinates our volunteering efforts and philanthropic investments, supporting initiatives in community life and education, as well as [encouraging safer driving](#).

### OUR PERFORMANCE

#### Investing in Society

We can help improve quality of life for all by working with, and contributing to, the communities where we live and work, as well as society as a whole.

- **\$63 million** in total charitable contributions in 2017<sup>1</sup> (Community Life \$36.8m, Education \$18.4m, Driver Safety \$7.8m)
- **More than 237,000** volunteering hours donated by current and retired employees through the Ford Volunteer Corps
- **More than \$1.5 billion** donated to date to civic organizations to strengthen communities around the world
- **100 STEAM scholarships** worth up to \$10,000 each awarded in 2017

## INVESTING IN THE NEXT GENERATION

**We believe it's vital to inspire an interest in technology and innovation among schoolchildren. As the world moves forward ever-faster, we're preparing students to step up to the challenges ahead.**

### Investing in Technology and Innovation

To strengthen our pipeline of potential future talent, we have developed a consistent global strategy that focuses on STEAM (science, technology, engineering, art and math) programs. We aim to develop and deliver innovative programs for students and educators around the world that nurture technical talent. In doing so, we prioritize programs that leverage skills and help foster long-lasting partnerships and engagement.

### Our Support for STEAM Programs

#### Powered by Ford STEAM Academies

Our Powered by Ford STEAM Academies are designed to attract high-school students and prepare them for life beyond school. Alongside core academic subjects, students participate in engineering, information technology and manufacturing projects, which in many cases are conducted at our own sites.

We also award millions of dollars in scholarships to support social mobility, providing much-needed financial support to assist high-achieving college-bound students with their studies. In 2017 we awarded 100 Blue Oval STEAM Scholarships worth up to \$10,000 each, including 29 to female students.

#### Ford STEAM High School Community Challenge

Ford Next Generation Learning (NGL) is a signature program of [Ford Fund](#). Ford NGL has teamed up with the Ford STEAM program to support creative high-school students. The Ford STEAM High School Community Challenge empowers students to make a positive difference in their communities. Supported by \$50,000 in grants from Ford and with participation from community partners, students use their technical skills to propose solutions that address unmet needs in technology, alternative energy, health and other areas.

In 2018, six teams from across the United States were selected to implement their inventive solutions. The winner, Spruce Creek High School in Port Orange, Florida, was awarded \$20,000 to develop

a smartphone application that enables people in disaster areas to communicate with emergency response teams, family and friends.

Runner-up, the Utica Center for Science and Industry in Sterling Heights, Michigan – a Powered by Ford STEAM Academy – will use its \$10,000 award to harness centripetal force created from gym equipment through a turbine system to reduce the harmful use of resources to create electricity.

Four other teams, from California, Florida, Georgia and Texas, each received \$5,000.

> [Learn more about this year's winning projects.](#)

#### FIRST® Robotics

Robots are increasingly an important part of the workplace. Our [FIRST® Robotics](#) program challenges teams of students to compete to fund, build and program robots to perform certain tasks, against tight schedules and with limited resources. Ford provides grants and mentor engagement to more than 100 elementary and middle schools and 87 high-school teams, helping them participate in a range of STEAM challenges. In addition, in 2017-18 more than 200 employees volunteered to act as mentors to Ford-sponsored teams.

#### Girls Who Code

Women are significantly underrepresented in the tech industry. To help address this, the Ford Research and Innovation Center (RIC) at Palo Alto, California, has partnered with [Girls Who Code](#), a nonprofit organization that aims to inspire, educate and equip young women with the skills needed to pursue academic and career opportunities in computing. RIC is providing opportunities for young women interested in science, technology, engineering and math (STEM).

Across the United States, Girls Who Code programs combine instruction in robotics, web design and mobile development with mentorship from top engineers at RIC. In this way, students gain exposure to real-life role models and hands-on experience on projects at our Silicon Valley research lab.

#### Primary Engineer

Around the world, there is a shortfall of young people entering engineering as a career. To help tackle this, in the U.K. Ford Fund supports Primary Engineer, a nonprofit organization that runs engineering-based courses for primary-school children (aged 7-11) with a £15,000 grant.

In 2017, we launched an exciting STEM initiative for primary-school children in 20 schools across Essex in the southeast of the U.K. We invited 40 teachers from 20 schools to the Ford Dunton Technical Centre to take part in a one-day practical course. The Technical Centre – home to 3,000 highly skilled designers, engineers and support staff – hosted the training day, which supported teachers and support teachers in the practical aspects of delivering a classroom engineering project.

*“There is a recognized shortage of engineers across Europe. Children form ideas about suitable careers from a very young age, and so we need to work with schools to ensure that children of a primary age are given the opportunity to learn more about STEM – and are encouraged to consider a future in the area.”*

**Linda Carpenter**

Director, Product Planning and Strategy, Ford Dunton Technical Centre

### Empowering Through Education

As well as STEAM programs, Ford Fund supports initiatives that empower young people to take control of their future, improve people's lives, and drive upward social mobility.

### Ford College Community Challenge (C3)

The Ford College Community Challenge (Ford C3) supports young people and encourages social entrepreneurship through the implementation of sustainable community solutions. 2017 saw the 10th anniversary of Ford C3 globally and the third anniversary of its operation in Europe, where it partners with registered charity Enactus. Operating in 58 universities across the U.K., the international nonprofit organization enables student-led teams to create community development projects. The 2017 Ford U.K. Innovation Challenge, part of Ford C3, offered teams the opportunity to win £25,000 to upscale a community initiative that addressed an unmet social need or problem. The winner, the University of Sheffield’s “Motion” project, delivers chair-based exercise sessions for the elderly with the intent of increasing physical mobility, reducing social isolation and improving the lives of participants, while also providing employment for vulnerable people.

### 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.

Related Pages:

- > [Building Sustainable Communities](#)
- > [Employee Volunteering](#)

## BUILDING SUSTAINABLE COMMUNITIES

**At Ford, we recognize the need for strong communities and the role we can play in leveraging our resources to support community life.**

By making people’s lives better in communities around the globe, we can help achieve a better world. We’re focusing our efforts in key areas including hunger relief, poverty alleviation, and support for the elderly, disabled, military veterans and other underrepresented populations. We also support environmental initiatives, with a particular emphasis on access to water, hygiene and sanitation.

In 2017, we supported more than 700 community groups and projects, including:

- Opening a second Ford Resource and Engagement Center in Detroit
- Being lead investor in the Cass Community Social Services tiny homes project in Detroit, an innovative neighborhood revitalization plan designed to provide affordable housing for low-income residents and people who were once homeless

### Building a Better World

Project Better World is rooted in Ford’s belief in social business – being intentional about the business of making the world a better place. Through Project Better World, we work with government agencies, corporations, civil society, impact investors, social entrepreneurs and academia to find ways to improve the human condition. Activities focus around the key areas of health, education and driver safety.

Our current work focuses on three locations: India, Nigeria and South Africa. Working with four major partners – World Vision, Riders for Health, George Washington University and Global Water Challenge – our activities have positively impacted 140,000 lives to date.

### India

In India, we have partnered with World Vision to deliver innovative health and educational services in local communities through mobile clinics and libraries. Using two Ford Endeavors, World Vision’s interventions have reached more than 57,000 people, including:

- 9,612 schoolchildren who received training in water, sanitation and hygiene
- 10,915 schoolchildren given access to a mobile library
- 1,370 drivers trained on road safety awareness
- 3,104 children vaccinated for measles and rubella
- 5,450 community members who participated in medical health camps

### Nigeria

Riders for Health, along with the Nigerian Ministry of Health and three NGOs, is using two Ford Rangers to deliver critical health interventions to more than 81,000 people. Services include HIV and AIDS testing, TB screening, malaria treatment, prescription drug distribution and viral particle measurements for HIV patients.

### South Africa

Using two Ford Rangers, we have supported World Vision in delivering child and maternal health services to thousands in underserved communities:

- 2,848 people have received TB screening, HIV testing and deworming treatments
- 1,368 people have attended health presentations and engagements
- 462 have participated in health clubs, with meetings and training

## Transforming Communities

Ford Fund’s Operation Better World is a coordinated, grassroots initiative with nonprofits and dealers to develop transformational programs focused on mobility, education and sustainable communities.

In collaboration with the nonprofit Global Giving Foundation, innovative programs in 56 markets utilize the expertise of local Ford teams and community leaders to make a world of difference. Here are just some of our recent activities:



### Australia

We recently set up a STEAM Hub at Northern Bay College in Geelong, running events and mentoring student teams in interschool competitions designed to promote science, technology, engineering, arts and mathematics. In 2017, engineers from our nearby Product Design Center contributed 1,048 hours to support STEAM projects, reaching 5,700 students directly.



### Laos

Employees from Lao Ford City in Laos also teamed up with World Vision, with 20 volunteers cleaning the grounds of Mahosot Hospital and donating cleaning equipment.



### The Philippines

Together with the American Chamber Foundation Philippines, Ford supports a number of communities through development agency Gawad Kalinga. In 2017, Ford employee and dealer volunteers spent 824 hours helping build, paint and repair houses for 20 families; organized children’s activities; and conducted six medical and dental missions, benefiting 2,419 people. Ford also led the training of 158 health care volunteers.

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### South Africa

Partnering with the Wildlife and Environment Society of South Africa (WESSA) and the National Council for Persons with Disabilities, in 2018, Ford South Africa funded the purchase of specially adapted wheelchairs. These can traverse sand, enabling people with physical disabilities to access the beach.



### Sri Lanka

Ford volunteers from Future Automobiles Ltd., together with World Vision Lanka, set up a mobile medical camp to support 400 underprivileged residents of Kattumurivu village.



### United Arab Emirates

The Henry Ford Entrepreneurial Academy (HFEA), which promotes entrepreneurship across the Middle East and Africa, held a three-day workshop for 40 participants at the newly opened Youth Hub in Dubai, in conjunction with the UAE's Ministry of Affairs. In 2018, further events took place in Ras Al Khaimah and Dubai in the UAE, as well as in Morocco and Saudi Arabia.

Related Pages:

> [Regional Review](#)

## Disaster Relief

Ford has a long history of assisting communities devastated by natural disasters around the world. Each year Ford Fund provides more than \$1 million in grants to nationally recognized aid organizations, as well as donating vehicles, supporting employee-matching and volunteer programs, and coordinating with dealers to mobilize immediate and long-term assistance.

In the aftermath of Hurricane Harvey, Ford and Ford Fund worked with Houston-area dealers to raise \$3.5 million to support relief efforts. Ford Fund and Ford Puerto Rico have also teamed up with local nonprofits, investing more than \$1.2 million to support continuing disaster recovery efforts following Hurricanes Irma and María. Two Ford Social Mobility Centers are providing residents with food, water and other supplies. Ford Fund also announced the donation of two additional vehicles to provide educational and medical services around the island. Three vehicles donated to the Salvation Army and Red Cross have been able to transport greater quantities of supplies to remote island neighborhoods.

Ford Fund also continues to innovate and expand the reach of our helping hands. The Ford Motor Company Disaster Relief Mobility Challenge is a U.S.-based initiative that challenges nonprofits to find creative ways to help people in their communities. The Challenge provides grants to assist the purchase of a custom-outfitted Ford Transit or truck to serve in missions that rebuild damaged communities. The first three recipients – Team Rubicon, ToolBank and Catholic Charities – all used their vehicles in support of Hurricane Harvey relief.

## Providing Access to Community Services

Ford was founded in Detroit in 1903, and we have been investing in the city and surrounding area ever since.

Together, Ford and Ford Fund have invested more than \$166 million in southeast Michigan over the past 10 years to support programs such as the Tiny Homes neighborhood project, a fleet of 20 Ford Mobile Food Pantries and Ford Blue Oval Scholarships. And since 2005, Ford Volunteer Corps has participated in nearly 10,000 local community service projects to make people's lives better.

To better support the communities we serve, we have now opened two Ford Resource and Engagement Centers in Detroit. These centers increase access to essential services, helping more than 85,000 people with food distribution, tax return preparation, education and job initiatives, legal assistance and other programs.

*"We want to harness the untapped potential in our schools and neighborhoods to help more people gain access to the benefits of a stronger, more prosperous Detroit."*

**Jim Vella**

President, Ford Motor Company Fund

## Case Study

### Ford Partners With Cancer Treatment Centers

*"Medicine is an ever-changing science where small changes have a huge impact on the lives of patients. With Ford's help, we are making huge improvements that will benefit the lives and treatment of future patients for years to come."*

**Prof Dr. Michael Hallek**

Director, Center for Integrated Oncology

A partnership in Germany shows how Ford can bring its expertise to help the wider community.

Mike Butler, a quality director at a Ford assembly plant in Cologne, Germany, was fascinated by the process through which he and fellow cancer patients were treated. He saw an opportunity to introduce practices from the car manufacturing facility, where he works, to cancer treatment centers, like the one that saved his life, so that they might run more smoothly.

Butler and his team researched and proposed changes that are now being implemented at the Center for Integrated Oncology (CIO) at the University of Cologne, and have already contributed to a 30 percent improvement in patient flow.

This has since developed into a two-way flow of ideas, as hospital staff are bringing their experience of working with big data to bear on Ford's research into future vehicles. The company is now applying this thinking in relation to future vehicles and new technologies.

Related Pages:

> [Employee Volunteering](#)

> [Investing in the Next Generation](#)

## 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.

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## Community Involvement in 2017

- **More than 36,000** volunteer participants
- **237,000 hours** of volunteering
- **\$5.7 million** in grants for tools and supplies
- **40** countries reached
- **1,766** community projects

## Our Volunteering Programs

### Ford Global Caring Month

September is Ford Global Caring Month and in 2017 more than 19,000 current and retired employee volunteers participated in 559 projects around the world. These included:

- **Australia:** Installed water tanks at a camp for underprivileged young people
- **Brazil:** Helped build a facility to care for impoverished families and children with cancer
- **China:** Community gardening, beach clean-up and environmental education
- **Germany:** Assisted with preparations for a new refugee camp
- **Mexico:** Home construction, school and shelter renovation
- **Philippines:** Building community water facilities in villages
- **South Africa:** Installed equipment to capture and store water at schools, and carried out building repairs

### Ford Seasons of Service

The Ford Volunteer Corps is evolving its year-round efforts to make people's lives better. Ford employees and nonprofit organizations have fully embraced our community volunteer work, but they need more flexibility to work around tight schedules or answer the call when nonprofits need it most. Responding to their feedback, we are now focused on four seasons of Ford volunteer service, rather than four days of concentrated efforts we called Ford Accelerated Action Days.

The seasons of service are:

- **Spring:** Children and Families, including the annual Diaper and Formula Drive in Michigan
- **Summer:** Better World, environmental projects, including the Green IT e-Waste Recycling Drive in June, which this year adds car seat recycling
- **Fall:** Community Building, with Ford Global Caring Month in September remaining our signature annual event
- **Winter:** Giving and Sharing, including hunger relief and the Kids' Coat and Jacket Drive

The Ford Volunteer Corps is also encouraging skill-specific volunteering to better utilize the advanced skills of more employees, who will return for future service, providing sustainable support for nonprofits. More than 60 Ford employees are trained and certified to work this year with Accounting Aid Society, which provides free tax services for low-income people in southeast Michigan to make sure they receive earned income tax credits and other benefits they are entitled to when they file their tax returns. Most of the Ford employees assisting with tax returns work in accounting or finance. The dollars are critical to helping people become more self-sufficient and improve their quality of life.

### Bill Ford Better World Challenge

The Bill Ford Better World Challenge is a global grant program, jointly funded by the company and Executive Chairman Bill Ford. Through the initiative, set up in 2015, employee volunteers can apply for grants, totaling up to \$500,000 a year, to support transformational community service projects that address issues around mobility; basic needs, such as food and shelter; or access to water, sanitation and hygiene.

In 2017, we awarded \$200,000 for two projects that will significantly improve health and sanitary conditions for people in India and Mexico:

- In the Kancheepuram district of India, 300 SMART toilets will be installed at residential homes to mitigate poor sanitation; the program includes education on good hygiene practices
- In Guayacan, Mexico, grant funds will build a community center where area residents can obtain uncontaminated water, have access to flushing toilets and receive a weekly free meal; the facility aims to serve 750 families

## Case Study

### Helping People Overcome Taxing Challenges

*"Ford provides a lot of volunteer opportunities, but this is one of the most rewarding experiences because you could possibly be generating cash for a client. It's often the largest amount of cash these people will get in an entire year."*

#### Bob Clary

State Tax Manager, Ford

Tax Manager Bob Clary has worked for Ford for 19 years. For all of that time, he's also been a volunteer tax preparer for the Accounting Aid Society. Accounting Aid provides free tax services for low-income residents in southeast Michigan to make sure they receive tax credits and other benefits they're entitled to when they file their tax returns. The money they receive is often critical to helping them become more self-sufficient and improving their quality of life.

More than 60 Ford employees are currently trained and certified to work on its volunteer tax assistance program, providing much-needed help to community members. In 2017, Accounting Aid helped local residents claim a total \$28 million to which they were entitled, an economic boost to the area that otherwise would have been out of the reach of those who need it most.

The tax help is available at both of [Detroit's Ford Resource and Engagement Centers](#).

Related Pages:

> [Building Sustainable Communities](#)

## SUPPLIER DIVERSITY

**We are committed to creating opportunities for diverse suppliers running minority-, women- and veteran-owned businesses that drive profitability and make their enterprises more sustainable.**

### Partnering for Diversity

Our nationally recognized Supplier Diversity Development (SDD) Program has led to productive business partnerships with diverse entrepreneurs, and valuable products and services for our customers through its leadership and success in driving innovative best practices.

In 2018, we announced the expansion of our program to include certifications from the [National LGBT Chambers of Commerce \(NGLCC\)](#), [US Business Leadership Network \(USBLN\)](#), the [Small Business Administration \(SBA\)](#) and [WEConnect International](#). This expansion emphasizes our commitment to rebranding our organization as not only diverse but also inclusive. Diversity is inevitable, but inclusion must be something that requires conscious and intentional efforts.

In 2017, Ford purchased goods and services worth:

- **\$8.98 billion** from minority-owned suppliers
- **\$0.56 billion** from veteran-owned companies
- **\$2.51 billion** from women-owned businesses

## Promoting a Diverse Supply Chain

For the past 40 years, Ford has recognized that having a diverse supply base is a fundamental part of our overall success. Diversity and inclusion among those who supply our products and services ensure that we are collecting fresh perspectives that, in turn, lead to cutting-edge innovations and accelerated business development. This further supports our dedication to fostering strong and productive relationships with entrepreneurs from a wide range of backgrounds to meet our customers' needs and expectations.

As well as buying from diverse suppliers, we work with business leaders, community organizations and trade associations that represent the interests of diverse businesses. We are members of the Billion Dollar Roundtable (BDR), a group of 27 corporate members across 10 industry sectors that each purchase at least \$1 billion of goods annually from diverse suppliers. The BDR promotes and shares best practices in supply chain diversity excellence through the production of white papers. It also encourages corporate entities to continue growing their supplier diversity programs by increasing commitment and spending levels each year.

Demonstrating our commitment, we have extended our leading role in one of the major supplier diversity advocacy organizations from January 2016 to December 2018. Joe Hinrichs, President of the Americas for Ford Motor Company, is currently Chairman of the Board for the National Minority Supplier Development Council (NMSDC).

## Supplier Development

Our Mentor Me program helps to advance and develop diverse suppliers through selective matching of senior executives from Ford and/or other partner organizations. During the one-day program, mentors assess the diverse business, evaluate real-time organizational challenges/opportunities, discuss future business and provide feedback to enhance leadership and communication in the areas selected by the diverse business. In 2017, we hosted four Mentor Me sessions.

**To date, we have sourced more than \$110 billion in goods and services through our Supplier Diversity Development (SDD) Program from minority-, women- and veteran-owned businesses.**

## Awards and Recognition

Our SDD Program received external recognition from a wide range of awards, rankings and rating agencies in 2017, confirmation that we continue to "maintain leadership in supplier diversity."

A number of individual Ford people were also recipients of honors and accolades, as shown below.

### Major Recognition for Our Supplier Diversity Program

- 2017 National Minority Supplier Development Council – Corporation of the Year Award
- 2017 Michigan Minority Supplier Development Council – Corporation of the Year Automotive OEM Winner
- 2017 Women's Business Enterprise National Council – America's Top Corporation Gold Award
- 2017 National Veterans Business Center, Founder's Award
- Veteran Business Roundtable, Corporate Member 2017–2018 Award
- U.S. *Veterans Magazine* – Best of the Best (Top Veteran Friendly and Top Supplier Diversity)

### Individual Awards for Ford Employees

- *MBNUSA* magazine – Champions of Supplier Diversity: Hau Thai-Tang, Group Vice President, Global Purchasing and Product Development
- *MBNUSA* magazine – Champions of Supplier Diversity: Renee Jones, Director, Supply Chain Development
- *MBNUSA* magazine – Champions of Supplier Diversity: Stephanie Williams, Manager, Supplier Diversity Development
- *Diversity Plus* magazine – Showcasing 2017 Top 25 Women in Power Impacting Diversity: Renee Jones, Director, Supply Chain Development

#### Related Pages:

- > [Data: Supplier Diversity](#)
- > [Environmental Impact of Our Suppliers](#)

# PERFORMANCE, DATA AND REPORTING

**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 how we are performing in key areas, and a range of tables and charts providing more detailed performance data.

## GOALS AND PROGRESS

This table summarizes Ford's goals, commitments, targets and progress.

Please see our [key performance data](#) and data tables and charts for our complete data reporting and accompanying notes.

| GLOBAL MOBILITY   |   |            |
|---|---|------------|
| Goal  | 2017 Progress Examples  | Status     |
| Deliver our Ford Smart Mobility plan, with a focus on emerging opportunities in mobility. | <p>To deliver a broader suite of mobility products and services, we have established four new, integrated teams:</p> <ul style="list-style-type: none"> <li>• Ford X: incubator for potential products and services, and new mobility businesses</li> <li>• Mobility Business Group: scaling our existing mobility businesses</li> <li>• Mobility Platforms and Products: leading the design and development of relevant technology</li> <li>• Mobility Marketing and Growth: driving demand with consumers, commercial customers and cities</li> </ul> <p>We are acquiring transportation solutions business Autonomic and TransLoc, a provider of demand-response technology for city-owned microtransit systems.</p> <p>We are developing the <a href="#">Transportation Mobility Cloud</a>, an open software platform that will allow vehicles, streets and cities to talk to each other and plan the most efficient routes for people.</p> <p>In 2017, we opened our Ford Smart Mobility Innovation Office in London.</p> <ul style="list-style-type: none"> <li>&gt; <a href="#">Global Mobility</a></li> <li>&gt; <a href="#">North America</a></li> <li>&gt; <a href="#">South America</a></li> <li>&gt; <a href="#">Europe</a></li> <li>&gt; <a href="#">Middle East and Africa</a></li> <li>&gt; <a href="#">Asia Pacific</a></li> <li>&gt; <a href="#">Smart Vehicles for a Smart World</a></li> </ul> | In Process |

| CUSTOMERS AND PRODUCTS  |  |            |
|---|--|------------|
| Goal  | 2017 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 fell by 1 percent in 2017. On an individual basis, our vehicles continue to make fuel economy improvements and our combined fleet fuel economy has improved by 9 percent over the last decade, compared to 2009.</p> <p>Our award-winning, fuel-saving EcoBoost® technology has been used in more than 8 million engines worldwide.</p> <ul style="list-style-type: none"> <li>&gt; <a href="#">Improving Fuel Economy</a></li> </ul> | In Process |

|                         |                        |            |                    |                      |
|-------------------------|------------------------|------------|--------------------|----------------------|
| Strategy and Governance | Customers and Products | Operations | People and Society | Performance and Data |
|-------------------------|------------------------|------------|--------------------|----------------------|

| CUSTOMERS AND PRODUCTS  |   |            |
|---|---|------------|
| Goal  | 2017 Progress Examples  | Status     |
| Pursue our electrification strategy.  | Our electrification strategy has seen us invest \$11 billion to put 40 hybrid and fully electric vehicle models on the road by 2022.<br>> <a href="#">Alternative Fuels and Powertrains</a>   | In Process |
| Continue our lightweighting plans.  | We are adopting advanced lightweight materials to help improve fuel economy wherever practicable. We reduced vehicle body weight by 200 pounds on the 2018 Lincoln Navigator, 300 pounds on the 2018 Ford Expedition and 350 pounds on the 2017 Ford Super Duty by switching to aluminum.<br>> <a href="#">Improving Fuel Economy</a>   | In Process |
| Offer alternative fuel vehicles.  | We have developed a roadmap for migrating our vehicle technologies toward powertrain and fuel options designed to reduce vehicle CO <sub>2</sub> emissions and improve fuel efficiency.<br>We continue to support the development of vehicles powered by next-generation biofuels, compressed natural gas (CNG) and liquefied petroleum gas (LPG).<br>> <a href="#">Alternative Fuels and Powertrains</a>   | In Process |
| 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. | Guided by our global materials strategy, we continue to lead the research, development and integration of plant-based, renewable and recycled content in our vehicles. We currently feature eight sustainable materials in our production vehicles: soy, wheat, rice, castor, kenaf (hibiscus), tree cellulose, jute and coconut.<br>Ford was the first in the industry to develop foams and plastics using captured carbon dioxide.<br>We continue to research the possible use of tomato skin, bamboo, agave fiber, dandelions and algae.<br>We are one of 10 global auto manufacturers to join the Raw Materials Observatory, launched by the Drive Sustainability partnership.<br>> <a href="#">Using Sustainable Materials</a> | In Process |
| Design and manufacture vehicles with safety excellence focused on real-world safety and offer innovative safety and driver assist technologies.<br>Meet or exceed all regulatory requirements for safety.   | Automotive safety encompasses all aspects of our business, from vehicle design and manufacturing to operator behavior and road infrastructure.<br>Our corporate safety policy, Policy Letter 7, outlines our commitment to designing and manufacturing vehicles that achieve high levels of safety over a wide range of real-world conditions.<br>We continue to receive high marks for vehicle safety in a number of the industry’s key public and private crash-testing programs.<br>> <a href="#">Improving Vehicle Safety</a>   | In Process |
| Provide information and educational programs to assist in promoting safe driving practices.   | Ford Driving Skills for Life (DSFL), our free driver education program, reached 40,000 participants in 2017, and is now active in 41 countries. We also launched a customized program for women drivers in Saudi Arabia.<br>> <a href="#">Encouraging Safer Driving</a><br>> <a href="#">A Force for Good</a>   | In Process |
| Play a co-leadership role in vehicle safety and driver assist research and innovation.  | Continued to collaborate with:<br>> Other automotive companies on precompetitive safety projects<br>> University partners on a wide range of research projects, including research into advanced safety technologies<br>> <a href="#">Driver Assist Technologies</a>  | In Process |

|                         |                        |            |                    |                      |
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| OPERATIONS   |  |            |
|--|--|------------|
| Goal   | 2017 Progress Examples   | Status     |
| Reduce global facility CO <sub>2</sub> emissions per vehicle produced by 30 percent between 2010 and 2025.   | By the end of 2017, we had achieved a 32 percent reduction in GHG emissions per vehicle since 2010. This means we achieved our 2025 target eight years early.<br><br><a href="#">› Operational Energy Use and CO<sub>2</sub> Emissions</a>   | Achieved   |
| Reduce global facility energy use per vehicle produced by 25 percent between 2011 and 2016.  | In 2017, we reduced facility energy consumption (on a per-vehicle basis) by 6.8 percent compared to 2015, and we continue to focus on driving efficiencies in energy use throughout our facilities around the world.<br><br><a href="#">› Operational Energy Use and CO<sub>2</sub> Emissions</a>                        | In Process |
| 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. | We have achieved a 32 percent reduction in water use (per vehicle) since 2010.<br><br><a href="#">› Water Use</a>  | In Process |
| Reduce global waste sent to landfill by 40 percent per vehicle produced between 2011 and 2016.   | We reduced waste to landfill on a per-vehicle basis by 18 percent last year, and by 61 percent over the last five years, significantly exceeding our target. Having completed our five-year global waste reduction plan, we are in the process of developing a subsequent plan.<br><br><a href="#">› Waste Reduction</a> | Achieved   |

| HUMAN RIGHTS / SUPPLY CHAIN  |   |            |
|--|---|------------|
| Goal   | 2017 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. Our list of 22 high-priority countries remained unchanged in 2017.<br><br>At the end of 2017, 100 percent of our production Aligned Business Framework suppliers had codes of conduct aligned with our Policy Letter 24, and 85 percent had robust systems governing their own operations and those of their supply chain.<br><br>In line with the <a href="#">UN Guiding Principles Reporting Framework</a> , we conducted a formal assessment to identify our most salient human rights. The analysis, involving a third-party consultancy, included desk-based research, internal and external interviews, and a workshop to validate our findings.<br><br><a href="#">› Human Rights</a><br><a href="#">› Environmental Impact of Our Suppliers</a> | In Process |
| Help suppliers build their capacity to manage supply chain sustainability issues.  | During the year, supplier representatives from 203 direct and indirect supplier sites in five countries attended in-country training sessions covering human rights, working conditions, business ethics and the environment.<br><br><a href="#">› Environmental Impact of Our Suppliers</a>  | In Process |
| Assess Tier 1 suppliers for compliance with local laws and Ford's supply chain sustainability expectations.  | We have conducted more than 1,075 supplier audits and 1,400 follow-up assessments since 2003.<br><br>Having become the first automaker to join the Responsible Business Alliance (RBA), in 2017, we conducted 27 new audits using its Validated Assessment Process (VAP) methodology. All were externally validated and certified by the RBA.<br><br><a href="#">› Auditing Our Suppliers</a>   | In Process |
| Engage with our supply chain to understand its carbon and water footprints.  | Surveyed 264 production suppliers (81 percent) response rate), as well as indirect suppliers of logistics and information technology services, using the CDP Supply Chain program's questionnaire; 209 suppliers (75 percent) also responded to the CDP Water questionnaire.<br><br><a href="#">› Environmental Impact of Our Suppliers</a>   | In Process |

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## HUMAN RIGHTS / SUPPLY CHAIN

| Goal  | 2017 Progress Examples   | Status     |
|---|--|------------|
| Work with selected suppliers to reduce our collective environmental footprint by encouraging target setting and sharing best practices for energy and water use reductions. | Our supply chain sustainability initiative, the Partnership for A Cleaner Environment (PACE), seeks to reduce the overall environmental impact of Ford and our supply chain partners, enabling us to share the best practice examples we've implemented with 50 suppliers.<br><a href="#">&gt; Environmental Impact of Our Suppliers</a> | In Process |
| Improve the transparency of mineral sourcing within our supply chain while improving the capacity of conflict-free smelters.  | For the past three years, we met our goal to achieve a 100 percent response rate from in-scope suppliers.<br><a href="#">&gt; Responsible Sourcing of Raw Materials</a>  |            |
| Continue effort to source purchases from veteran-, minority- and women-owned businesses.  | Ford purchased goods and services worth \$8.98 billion from minority-owned suppliers; \$2.51 billion from women-owned businesses; and \$0.56 billion from veteran-owned companies.<br><a href="#">&gt; Supplier Diversity</a>  | In Process |

## HEALTH AND SAFETY

| Goal   | 2017 Progress Examples   | Status       |
|--|--|--------------|
| Fatalities target is always zero.  | In 2017, we experienced two fatalities: one an employee, the other a contractor, both in North America. Any loss of life or serious injury is unacceptable and deeply regretted. As with all workplace incidents, the circumstances were analyzed in detail and actions taken to prevent reoccurrence.<br><a href="#">&gt; Health and Safety</a> | 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 (LTCR) at the end of 2017 stood at 0.38 cases with one or more days away from work per 200,000 hours, compared to 0.39 in 2016. We are currently on target to meet our 2018 objective of 0.36.<br><a href="#">&gt; Health and Safety</a>   | On Track     |
| Maintain or improve employee personal health status through participation in health risk appraisal and health-promotion programs.  | We continue to provide programs and services that help employees achieve health and well-being, and make informed choices. In 2017, 80 percent of our U.S. salaried active employees participated in our annual wellness program.<br><a href="#">&gt; Health and Safety</a>  | In Process   |

## KEY PERFORMANCE DATA

Below is a summary of key performance data for 2017. Please see our data tables and charts for more detail and trends. For further information on data boundaries and assurance, please see [Reporting, Assurance and Frameworks](#).

## FINANCIAL HEALTH

|                                     | 2015 | 2016 | 2017             |
|-------------------------------------|------|------|------------------|
| Adjusted pre-tax profit, \$ billion | 10.8 | 10.4 | 8.4 <sup>1</sup> |

## CUSTOMERS AND PRODUCTS

|   | 2015 | 2016             | 2017              |
|---|------|------------------|-------------------|
| Ford U.S. corporate average fuel economy, combined car and truck fleet, miles per gallon (higher mpg reflects improvement)                                      | 30.0 | 29.8             | 29.6 <sup>2</sup> |
| Ford U.S. CO <sub>2</sub> tailpipe emissions per vehicle, combined car and truck fleet, grams per mile (lower grams per mile reflects improvement) <sup>3</sup> | 296  | 308 <sup>4</sup> | 306 <sup>5</sup>  |

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and Data**CUSTOMERS AND PRODUCTS**

|  | 2015    | 2016    | 2017                |
|--|---------|---------|---------------------|
| Ford Europe CO <sub>2</sub> tailpipe emissions per passenger vehicle, grams per kilometer (100% of vehicles)   | 118,133 | 119,964 | 120.86 <sup>6</sup> |
| Global Quality Research System “things gone wrong” (3 months in service), total “things gone wrong” per 1,000 vehicles   |         |         |                     |
| North America  | 1,265   | 1,273   | 1,132               |
| South America  | 1,207   | 1,119   | 1,082               |
| Europe   | 1,232   | 1,379   | 1,295               |
| Middle East & Africa   | 775     | 510     | 802                 |
| Asia Pacific   | 846     | 788     | 842                 |
| Global Quality Research System customer satisfaction (3 months in service), percent highly satisfied   |         |         |                     |
| North America  | 81      | 81      | 83                  |
| South America  | 70      | 68      | 69                  |
| Europe   | 75      | 73      | 72                  |
| Middle East & Africa   | 67      | 70      | 64                  |
| Asia Pacific   | 71      | 68      | 69                  |
| U.S. safety recalls, number  | 40      | 33      | 37                  |
| U.S. safety recalls, million units   | 4.99    | 5.97    | 3.79                |
|  | 2016    | 2017    | 2018                |
| Percent of nameplates achieving five-star New Car Assessment Program (NCAP) Overall Vehicle Score (percent of Ford Motor Company vehicles tested by model year) <sup>7</sup> | 62      | 71      | 60                  |

**OPERATIONS**

|   | 2015             | 2016  | 2017  |
|---|------------------|-------|-------|
| Worldwide facility energy consumption, billion kilowatt hours                 | 14.6             | 14.2  | 13.8  |
| Worldwide facility energy consumption per vehicle, kilowatt hours per vehicle | 2,244            | 2,133 | 2,092 |
| Worldwide facility CO <sub>2</sub> emissions, million metric tons             | 4.7              | 4.6   | 4.4   |
| Worldwide facility CO <sub>2</sub> emissions per vehicle, metric tons         | 0.72             | 0.69  | 0.67  |
| Global water use per vehicle produced, cubic meters                           | 3.9 <sup>8</sup> | 3.7   | 3.7   |

**SUPPLY CHAIN**

|  | 2015    | 2016    | 2017    |
|--|---------|---------|---------|
| Total supplier sites trained/retrained in sustainability management (cumulative, since 2005) | 3,156   | 3,302   | 3,549   |
| Assessments to date  | 1,071   | 1,106   | 1,133   |
| Training cascade to workforce, individuals trained   | 630,218 | 705,216 | 769,857 |

**COMMUNITIES**

|  | 2015 | 2016 | 2017 |
|--|------|------|------|
| Ford Motor Company Fund charitable contributions, \$ million | 37.2 | 38.9 | 40.6 |
| Corporate charitable contributions, \$ million               | 18.4 | 20.0 | 22.4 |
| Volunteer Corps, thousand volunteer hours                    | 186  | 204  | 237  |

|                         |                        |            |                    |                      |
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| OUR PEOPLE  |      |      |       |
|---|------|------|-------|
|   | 2015 | 2016 | 2017  |
| 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 | 0.65 | 0.63  |
| South America   | 0.54 | 0.42 | 0.42  |
| Europe  | 0.36 | 0.43 | 0.42  |
| Middle East & Africa  | 0.10 | 0.32 | 0.1   |
| Asia Pacific  | 0.03 | 0.03 | 0.024 |
| Employee satisfaction, Pulse survey, overall, percent satisfied   | 76   | 77   | 72    |
| Global salaried employees by gender, percent  |      |      |       |
| Male  | 74   | 73   | 73    |
| Female  | 26   | 27   | 27    |

1. See pages 25 and 79 of Ford's 2017 Form 10-K for definition and reconciliation to GAAP.
2. Includes FFV credits. Does not include A/C or Off-Cycle credits. The decline in combined car and truck fuel economy of 1% YOY is primarily due to customers purchasing larger cars and more trucks and reduced CAFE FFV credits. Despite the decrease in combined car and truck CAFE, on an individual basis, our vehicles continue to make fuel economy improvements. See [Improving Fuel Economy](#). Combined fleet fuel economy has improved by 9% compared to 2009.
3. The GHG value includes FFV credits.
4. The increase in combined car and truck CO<sub>2</sub> is primarily due to customers purchasing larger cars and more trucks. Our combined fleet CO<sub>2</sub> emissions improved by 10% compared to 2009.
5. Includes Advanced Technology Multipliers. Does not include A/C or Off-Cycle credits.
6. EEA/EU COMMISSION published preliminary 2017 CO<sub>2</sub> data. Official data expected in Q4 2018. Fleet performance without FFV, Eco-Innovation and Super credits.
7. Data includes Ford and Lincoln.
8. Changes were due to water meter repairs at a few facilities.

## REPORTING, ASSURANCE AND FRAMEWORKS

Welcome to Ford's 19th annual report on our sustainability progress. At Ford, we see reporting as an ongoing, evolving process, not an annual exercise. We expect our reporting to evolve further still and invite your feedback on this report, as well as our approach to reporting, at [sustaina@ford.com](mailto:sustaina@ford.com).

### Reporting Scope and Boundaries

This report covers the year 2017 and early 2018. The data is primarily for 2017 (for operations) and for the 2017 and 2018 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.

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 Content Index](#).

Where relevant, data measurement techniques, the bases of calculations, changes in the basis for reporting or reclassifications of data previously reported are included as footnotes to tables and charts.

### Data Assurance

Data in this report is subject to various forms of assurance, as outlined below and noted in the data tables. The [summary report](#) was reviewed by Ford's top senior executives, as well as the Sustainability and Innovation Committee of the Board of Directors.

Some of the data in our reports has been subject to internal and third-party verification.

- Financial data was audited for disclosure in the Ford Annual Report on [Form 10-K](#)

- Verification data is not yet available for Ford's 2017 global facility greenhouse gas (GHG) emissions. One hundred percent of Ford's 2017 global facility GHG emissions will be third-party verified to limited assurance. Over 75 percent of Ford's 2017 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 EU Emissions Trading Scheme (EU-ETS) are third-party verified. All EU-ETS verification statements are provided to Ford, by facility, from Lucideon (formerly CICS) for U.K. facilities, Lloyds for Spain 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 carbon dioxide emissions to national emissions registries or other authorities in the U.S., Canada, Mexico, Brazil, China and Taiwan, and the EU (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.

### Reporting Frameworks

#### United Nations Global Compact

This report serves as Ford's annual United Nations Global Compact (UNGC) Communication on Progress as it includes:

- Discussion of Ford's implementation of the 10 principles of the UNGC
- Support for the [United Nations Sustainable Development Goals](#)

> [See our UN Global Compact Index for further details](#)

#### UN Guiding Principles Reporting Framework

This is our second year of using the UN Guiding Principles Reporting Framework (UNGPRF), launched in February 2015 to provide companies with comprehensive guidance on their responsibilities with regards to reporting human rights issues. These are set out in a global standard, the UN Guiding Principles on Business and Human Rights.

> [See the UN Guiding Principles Reporting Framework Index for more information](#)

#### Global Reporting Initiative

This report is "in accordance" with the Global Reporting Initiative (GRI) Standards at a Comprehensive level. Ford Motor Company transitioned to the Standards in 2016/17.

More information on the GRI Standards can be found on the [GRI website](#).

> [See the GRI Content Index for a complete listing of indicators](#)