OPERATIONS

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

IN THIS SECTION

Teaming on Environmental Challenges

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

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

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

Focusing on Key Impacts

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

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

How We've Gone Further

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

Continued to focus on emissions reduction
Almost 53% reduction in worldwide facility GHG emissions *Since 2000*

Invested in closed-loop manufacturing processes and sent less waste to landfill
49% reduction in volume of manufacturing waste sent to landfills *Compared to 2012*

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

Energy Use and Greenhouse Gas Emissions

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

OUR APPROACH

Driving Down Facility GHGs

Reducing Energy Waste
Using less energy to make our vehicles and driving GHG reductions

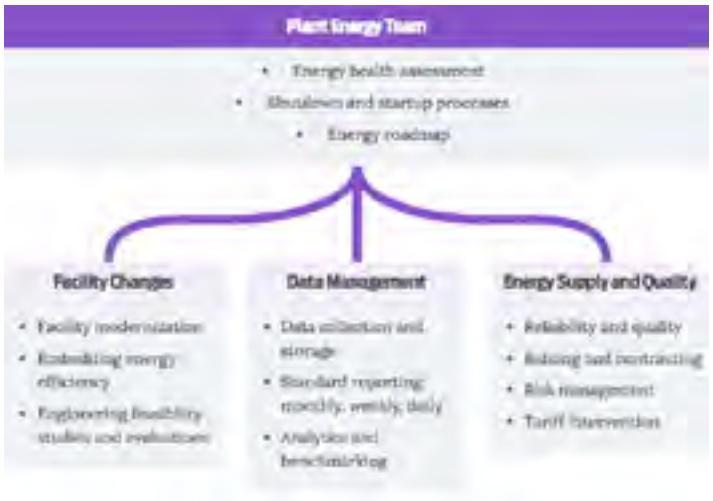
Investing in State-of-the-Art Facilities
Quality, safety and lean production

Participating in GHG Emissions Reporting and Trading
Supporting mandatory and voluntary schemes globally

Ensuring Compliance
Adhering to national carbon reduction requirements

Increasing Energy Efficiency

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



OUR PERFORMANCE

GHG Emissions From Our Facilities

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

Our performance

Reduction in CO_2 emissions per vehicle produced:
52% reduction per vehicle, 2000 to 2016
4% reduction per vehicle, 2015 to 2016

› See the full data tables for Operational Energy Use and CO_2 Emissions

Average Energy Consumption

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

Logistics Operations

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

Managing Logistics

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

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

Reporting Freight GHG Emissions

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

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

- We actively supported the development and road testing of the Greenhouse Gas Protocol Scope 3 reporting standard (see below)
- We account for a full range of GHG emissions, including nitrous oxide and methane, as well as CO_2
- We work with industry bodies and standards agencies to promote the ongoing development of improved reporting methods and develop best practices

Assessing and Reporting on Indirect Emissions

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

As reporting methods have evolved, we have adapted our calculations to take account of other GHGs (using the "CO_2 equivalent" approach) and emissions resulting from the production and generation of the fuel and other energy we use ("well-to-wheel" emissions).

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

Reducing Freight Emissions

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

Improving Freight Efficiency

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

We use regional distribution centers to coordinate deliveries.

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

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

Best Practice Technologies

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

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

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

Alternative Transport Modes

Maximizing the use of rail and river transport reduces both CO_2 emissions and traffic congestion.

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

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

› Read more about how we're helping our suppliers manage their environmental impacts

Water Use

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

OUR APPROACH

Water Matters

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

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

› Watch a video about Ford's approach to managing water use.

We're Part of the Collective Effort to Find Solutions

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

Direct Operations

Supply Chain and Watershed Management

Collective Action

Public Policy

Community Engagement

Transparency

We Work Inside and Outside Our Fence Line

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

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

In Our Communities

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

› Read more about the Thailand Clean Water Community Project

With Our Suppliers

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

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

› See more information about PACE

OUR PERFORMANCE

We Continue to Reduce Our Water Use in Vehicle Production

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

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

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

Our Performance

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

› See the full data for Water

Our Second "A" Grade for Water Conservation

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

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

Morgan Gillespy
Head of Water at CDP

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

Looking Ahead: Our Water Strategy to 2020

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

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

Our 2020 Target

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

CASE STUDY

Sanand Water Conservation, India

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

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

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

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

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

› Water Stewardship at Our Chicago Assembly Plant

› Conserving Water in Brazil

Waste Reduction

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

OUR APPROACH

Aiming for Zero Waste to Landfill

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

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

Our Focus on Waste Reduction

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

Our Current Waste Mix

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

OUR PERFORMANCE

Delivering Our Waste Targets

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

Our Performance

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

› See the full data for Waste

As of the publication of this report:

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

All our Canadian and Mexican **manufacturing plants are ZWTL facilities.**

CASE STUDY

Closed-Loop Aluminum Recycling

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

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

› Meet Chip Conrad, the Ford stamping engineer who led the design of the system that enables Ford to recycle large amounts of aluminum, one "chip" at a time.

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

How It Works

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

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

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

Chip Conrad

Optimizing Packaging

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

Reducing Our Overall Impact

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

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

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

CASE STUDY

IsoBins for Long-Distance Ocean Freight

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

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

Environmental Impact of Our Suppliers

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

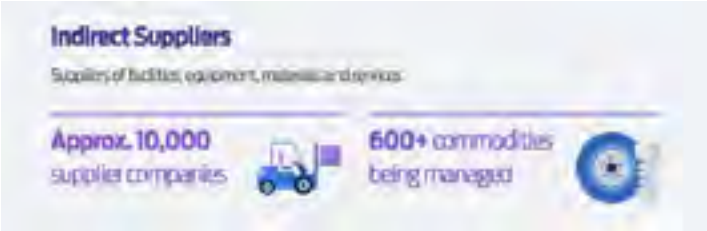
A Complex Supply Chain

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

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

› Read more about the diversity of our supplier base

Our Supply Chain at a Glance



Engaging With Key Suppliers

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

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

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

› Download a list of our ABF production and indirect suppliers

Our ABF Network

105 ABF suppliers, of which:

- **74%** are production suppliers and 26% are non-production suppliers
- **14%** are minority-, veteran- and women-owned suppliers

78 production ABF suppliers, of which:

- **100%** have codes of conduct aligned with our Policy Letter 24
- **82%** have robust systems governing their own operations and those of their supply chain

Understanding Our Suppliers' Impact

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

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

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

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

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

CDP Supply Chain Survey Results

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

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

› Visit the data section for more detail on supplier training

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

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

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

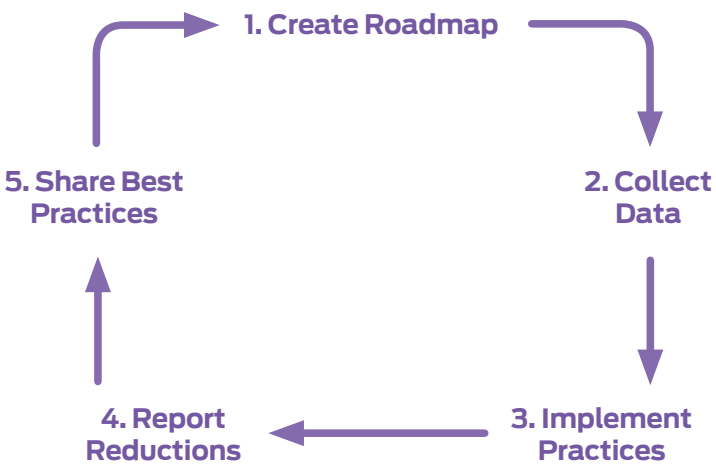
› Find out more about our impacts across our value chain

Building Supplier Capability Through PACE

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

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

The Five-Step PACE Process



1. Suppliers create multi-year roadmaps for improving environmental performance.
2. Baseline environmental data is recorded.
3. Successful approaches are selected and replicated.
4. Reductions in GHG and other emissions to air, energy consumption, water use and waste generation are measured, and progress against the baseline is reported.
5. Best practice examples, implemented by our suppliers or our own facilities, are updated and periodically shared.

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

› Read our front page story about how we're working with suppliers through PACE

Recognizing Supplier Excellence

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

› Read more about our efforts to develop a more sustainable and ethical supply chain through our human rights and working conditions program

› See a full list of World Excellence Award winners

Collaborating With Industry Partners

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

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