



Go Further

SUSTAINABILITY REPORT 2013/14

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## Water

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Voice: Brooke Barton



We have focused on reducing our water impacts since 2000 when we first began setting year-over-year reduction targets. Since then, we have moved beyond merely reducing the water footprint of our own facilities to working more holistically outside our corporate walls, addressing water concerns in our supply chain and our broader communities.

Read more about [OUR APPROACH](#)



## OUR WATER STRATEGY

We believe that business has a key role to play in finding sustainable solutions to current and future global water challenges. As an industry leader with more than 180,000 employees worldwide and manufacturing facilities or distribution channels across six continents, our reach enables large-scale positive impact.

Read more about [OUR WATER STRATEGY](#)

## OUR GOALS AND PERFORMANCE PROGRESS



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

We achieved our water reduction goal two years ahead of schedule. We will be updating our global manufacturing water strategy in 2014 and setting a new long-term target.



In 2014, we published our corporate water strategy, which builds upon our 2011 water strategy for our manufacturing operations.



Ford's water strategy aligns with the core elements of the CEO Water Mandate, which we endorsed in 2014.



Between 2000 and 2013, we reduced our total global water use by 61%, or more than 10 billion gallons.



Beginning in 2014, we will start asking our major suppliers – those we consider to be Tier 1 – to voluntarily report on their water use through CDP Water.

See more at [FORD'S GOALS, COMMITMENTS AND STATUS](#)



## A BASIC HUMAN RIGHT

We see water as far more than an environmental concern. Since 2012, Ford has recognized a basic human right to clean, affordable drinking water and adequate and accessible sanitation and, through our water strategy, seeks to uphold and respect that right.

Read more about [OUR EFFORTS](#)



Case Study: [SAVING WATER IN CUAUTITLÁN, MEXICO](#)

Our manufacturing facility in Cuautitlán, Mexico, is located in a region of water scarcity. Over the years, facility managers have come up with some creative solutions to their natural environmental challenges, reducing water use per vehicle produced at this plant by almost 58% between 2000 and 2013.

Voice: [BROOKE BARTON](#)  
Director, Ceres Water Program

“A business with a 21<sup>st</sup> century mindset views water as part of an interconnected ecosystem that is impacted by a host of variables, including changes in our climate. Water is understood to be a shared good that doesn’t just magically flow out of a pipe; it has a whole natural and engineered infrastructure supporting it.”



## WATER USE

Although the making of vehicles is not especially water intensive, we use water in many key manufacturing processes in our plants, including vehicle painting, and water is used at every point in our supply chain.

Read more about [OUR WATER USE](#)



## SUSTAINABLE SOLUTIONS

In 2014, we are marking the 10<sup>th</sup> anniversary of the rebuilt Dearborn Truck Plant at the Ford Rouge Center, which was hailed as a model of sustainable manufacturing when we rebuilt it in 2004. The facility incorporates extensive natural storm water management systems and a green roof that was the largest in the world when it was installed.

## 2013 HIGHLIGHTS



### 5% reduction

in average amount of water used to make each vehicle between 2012 and 2013.



### 61% reduction

in total global water use between 2000 and 2013 – or more than 10 billion gallons.



### 2% target

water reduction per vehicle produced from 2013 to 2014.



### 250

approximate number of suppliers we are asking to complete the CDP Supply Chain water questionnaire.



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## Overview

Water scarcity and water quality degradation rank among the biggest threats facing our planet. According to the World Economic Forum's 2014 Global Risks report,<sup>1</sup> water crises – from floods to droughts to pollution – placed third among the most worrisome threats to businesses and governments, behind fiscal crises (first) and structurally high unemployment/underemployment (second).

At Ford, we have focused on reducing our water impacts since 2000 when we first began setting year-over-year reduction targets as part of our Global Water Management Initiative. Our efforts around water have evolved over the years; we have moved beyond merely reducing the water footprint of our own facilities to working more holistically outside our corporate walls, addressing water concerns in our supply chain and our broader communities.

In 2014 we published our corporate water strategy, which builds upon our 2011 water strategy for our manufacturing operations. The corporate water strategy is designed to effect substantial, sustainable and measureable impacts within our own facilities, across our supply chain and in our regions of operation.

We believe that business has a key role to play in finding sustainable solutions to current and future global water challenges. As an industry leader with more than 180,000 employees worldwide and manufacturing facilities or distribution channels across six continents, our reach enables large-scale positive impact.



### REDUCING WATER USE

We achieved our water reduction goal two years ahead of schedule.



## The CEO Water Mandate

### WE SUPPORT

Our water strategy aligns with the core elements of the [CEO Water Mandate, a private-public initiative](#) launched by the UN Secretary-General in 2007. Companies that support the CEO Water Mandate commit to implementing the framework's six core elements for water management and pledge to publicly report their progress annually. Ford endorsed the Water Mandate in 2014.

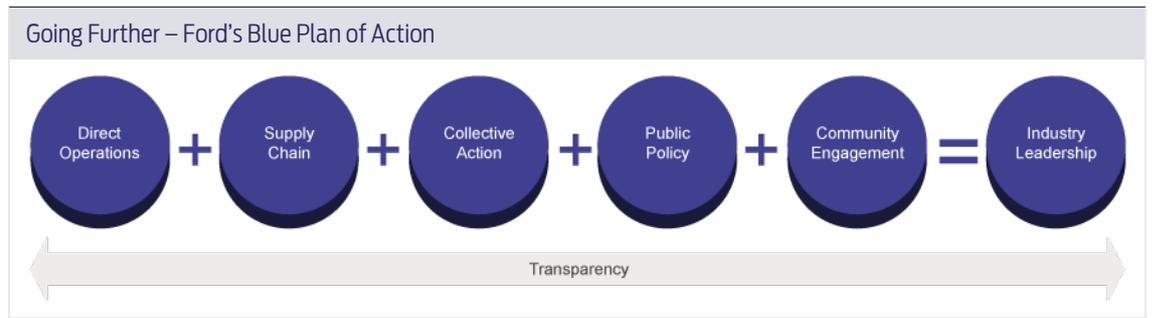
The Water Mandate's key elements are as follows:

- [Direct Operations](#)
- [Supply Chain & Value Chain](#)
- [Collective Action](#)
- [Public Policy](#)
- [Community Engagement](#)
- Transparency

Transparency underpins all of the other five areas. Across these five Water Mandate elements, we will develop communications and reporting channels that promote accountability. We will be transparent with key stakeholders, customers and the public by:

- publishing and sharing our company water strategy (including targets and results) in relevant corporate reports;
- publishing and sharing our global water usage for direct operations on both an absolute and per-vehicle produced basis; and
- being transparent in discussions with governments and other public authorities on water issues.

Together, these six elements will guide us toward a position of industry leadership.



We see water as far more than an environmental concern. Since 2012, Ford has recognized a basic human right to clean, affordable drinking water and adequate and accessible sanitation and, through this water strategy, seeks to uphold and respect that right. Our water strategy complements our overall human rights policy (Policy Letter 24: Code of Human Rights, Basic Working Conditions and Corporate Responsibility).

Our [analysis of Ford operations](#) shows that some of our facilities are located in regions where water supplies are already scarce. Global climate change also has the potential to further impact the quality and availability of water. We cannot be certain that we will always have access to water of the quantity and quality that our operations require. Our water strategy puts primary emphasis on our plants located in areas of water scarcity.

Ford is committed to conserving water and using it responsibly. We will address water challenges internally within our own operations and externally in communities where we operate and throughout our supply chain. We have committed to measureable actions to support our global water strategy, as described in each of the sections that follow below.

While we have demonstrated progress and positive global impacts through our efforts, we must also work collaboratively with other organizations on the world's water challenges. We are committed to continuous improvement through research and partnerships with other companies and organizations to develop improved best practices in responsible water stewardship.

Ford's environmental progress is evaluated at the highest levels of our company. The Board of Directors reviews our water-related progress annually. A cross-functional team from across Ford divisions – including our Environmental Quality Office and our Manufacturing, Purchasing, Research, and Community Relations functions – reviews water issues in a holistic way. In recent years, Ford has been meeting with a variety of groups – such as the Interfaith Center on Corporate Responsibility, the UN Global Compact, the U.S. State Department, Ceres and the Global Water Challenge – to gain a better appreciation of outside stakeholder perspectives.

1. Source: World Economic Forum. From a list of 31 risks, survey respondents were asked to identify the five they were most concerned about. [Download the World Economic Forum survey](#)



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## Direct Operations

We aim to conserve water and use it responsibly. Although the making of vehicles is not especially water intensive, we use water in many key manufacturing processes in our plants, including vehicle painting, and water is used at every point in our [supply chain](#).

Water scarcity can have an appreciable impact on our manufacturing operations. Our water-related risks come not only from being a direct water user, but also from being a large purchaser of materials, parts and components that have used water in their manufacture.

We set a global manufacturing water-use-per-vehicle reduction goal of 30 percent by 2015, using a 2009 baseline. We have already achieved this goal – two years ahead of schedule. We will be updating our global manufacturing water strategy in 2014 and setting a new long-term target. Our target for 2014 is a reduction of 2 percent per vehicle produced from 2013. We will continue to reduce water impacts in our manufacturing plants worldwide by:

- seeking opportunities for continuous improvement using methodologies such as [water assessments](#);
- [evaluating and implementing innovative technologies](#) to reduce water use and increase water recycling in manufacturing operations, where feasible, and incorporating consideration of water availability and risk in technology implementation;
- ensuring all employees have access to potable water, sanitation and hygiene in our workplaces;
- working with key local stakeholders in the communities in which we operate; and
- meeting local quality standards or Ford global standards for wastewater discharge (whichever is more stringent).

In 2011, we built water reduction actions into our Environmental Operating System (EOS), which provides a globally standardized, streamlined approach to meeting all environmental requirements, including sustainability objectives and targets.

### Related links

#### This Report

[→ Greening Our Operations](#)

### Gauging Our Strategy

As we worked to develop our corporate water strategy, we wanted to gain some independent, critical insight into our water stewardship activities and our related public disclosures. Enter the [Ceres Aqua Gauge™](#), an Excel-based tool designed to help companies like ours assess water risk management approaches in areas ranging from policy development and data gathering to business planning and goal setting. Developed by Ceres, the World Business Council for Sustainable Development, Irbaris and the Investor Responsibility Research Center Institute, the Aqua Gauge analyzed our activities to provide an outside view of how we were performing relative to leading practice.

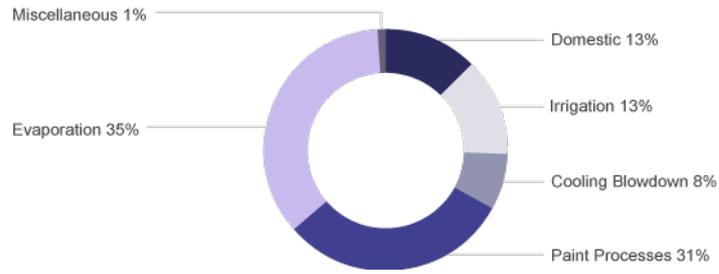
The initial assessments helped us understand how we could be more transparent and gave us insight into how our water strategy was being viewed by investors, stakeholders and customers. We then used the assessment to help us zero in on areas for improvement and leadership.

For example, the assessment told us that we are doing many of the right things already but could do a better job of communicating our approach and results. The assessment also revealed that we could do more to improve the company's extension of our water stewardship efforts into the supply chain.

After sharing the results with our senior executives, we now have a clearer understanding of how to improve our approach in 2014, where we stand, and where we need to go.

Read an [external perspective from the director of Ceres' Water Program](#) and an [article about our water workshop](#).

## Vehicle Assembly Plant Water Use



	%
Paint Processes	31
Cooling Blowdown	8
Irrigation	13
Domestic	13
Miscellaneous	1
Evaporation	35



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Voice: Brooke Barton

## Progress in Reducing Water Use

We began our Global Water Management Initiative in 2000, setting a target of 3 percent year-over-year reductions. In 2011, we announced a goal of reducing the amount of water used to make each vehicle by 30 percent globally from 2009 to 2015.

We have achieved this goal, two years ahead of schedule. We will be updating our global manufacturing water strategy in 2014 and setting a new long-term target. Our target for 2014 is a reduction of 2 percent per vehicle produced from 2013.

Between 2012 and 2013, we reduced the average amount of water used to make each vehicle by 5 percent. Between 2000 and 2013, we reduced our total global water use by 61 percent, or more than 10 billion gallons (see graphic below), by cutting the water we use in everything from cooling towers to washing parts to paint operations. (That's equivalent to the water used for 1 billion five-minute showers, based on figures from the U.S. Environmental Protection Agency, or enough to fill more than 15,000 Olympic-sized pools.) We decreased the total amount of water used around our global facilities from 64 million cubic meters per year to 25 million cubic meters.

### 10.6 billion gallons of water is:



the amount of water that flows over Niagara Falls in

**3.9 hours<sup>1</sup>**



equal to the amount of annual water use for about

**99,000 U.S. residences<sup>1</sup>**



**16,000 Olympic-size pools<sup>1</sup>**



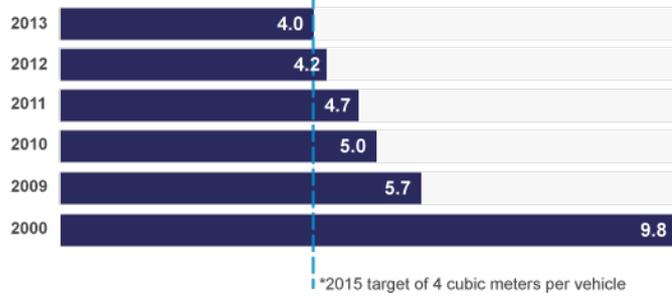
**265 million loads of laundry<sup>2</sup>**

We report on our progress in this annual Sustainability Report and through our participation in the CDP Water Disclosure, which we joined in 2010 – the first automaker to do so. We have also joined the U.S. Department of Energy's Better Plants Water Program as a pilot participant.

In 2013, we began tracking process water discharge at our manufacturing plants globally. Process water discharge is defined as the water used in manufacturing (including facility air conditioning) and released to the environment or discharged off-site. (It does not include sanitary sewage or storm water.) Tracking this metric will provide greater transparency around water usage within our facilities.

### Global Water Use per Vehicle Produced

*Cubic meters per vehicle*



### Total Global Water Use



[Global water use broken down by source](#) can be found on the data page.

### Learning from Each Other

Wherever possible, we try to replicate best practices from one plant to the next. This is especially true when it comes to environmental improvements, such as water reducing technologies. Each of our plants develops an annual action plan of potential projects that could help them to reduce water and to achieve targets in line with our strategies. Project feasibility is assessed based on regulatory requirements, budget, cycle plans and other considerations.

The decisions for project implementation are based on many variables, including success of projects at other plants. Successful projects that can be replicated elsewhere are communicated across the company so that other facilities can learn from them and determine whether they would work in a different setting.

1. U.S. Environmental Protection Agency
2. California Energy Commission



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# Investing in New Technologies

Ford has successfully implemented many water-savings initiatives across our plants to shrink our water footprint. Wherever feasible, we take successful projects and mirror them in other locations. Our newest plants use a set of advanced and environmentally friendly technologies to dramatically cut water use. Many of these new systems require substantial capital investments, so we have been adding them on a rolling basis as we update equipment and bring new facilities online, especially in areas where water is more scarce.

For example, we have implemented a membrane biological reactor (MBR) and reverse-osmosis process to recycle water from our on-site wastewater treatment plants in a number of our global production facilities that are located in more arid regions. This allows us to avoid using high-quality water suitable for human consumption in our manufacturing processes. By doing so at plants in Chihuahua and Hermosillo, Mexico; Pretoria, South Africa; Chennai, India; and Chongqing, China, we have been able to reuse more than 976,000 cubic meters of water, which means we have not had to withdraw that water from the environment.

In Pretoria, for example, our \$2.5 million on-site wastewater treatment plant at the Silverton Assembly Plant is increasing the amount of water that can be reused by up to 15 percent. A similar system installed at the Chennai Assembly Plant allows the plant to recycle 100 percent of its water. And two assembly plants in Chongqing, China, added advanced water treatment equipment to improve recycling. One plant recycles an average of 100,000 gallons daily while the other recycles an average of 65,000 gallons daily.

We also continue to replicate new technologies, including a process known as “dry-machining” that lubricates cutting tools with a fine spray of oil, rather than the conventional “wet-machining” that required large amounts of metal-working fluids and water to cool and lubricate the tools. For a typical production line, dry-machining – also known as Minimum Quantity Lubrication (MQL) – can save more than 280,000 gallons of water per year.

Over the last few years, we have further expanded our use of MQL. We currently have the capability in six plants around the world – a number that will nearly double in the next few years. These plants are as follows:

- Changan Ford Engine Plant (China)
- Craiova Engine Plant (Romania)
- Cologne Engine Plant (Germany)
- Livonia Transmission Plant (Michigan, U.S.A.)
- Romeo Engine Plant (Michigan, U.S.A.)
- Van Dyke Transmission Plant (Michigan, U.S.A.)

MQL has other benefits in addition to water savings. It reduces the amount of oil needed to machine an engine or transmission by 80 percent or more to approximately 100 milliliters – or about half the size of an average drinking glass. And by avoiding the need for a coolant system across most engine production lines, MQL helps to reduce energy use. MQL also improves plant air quality by eliminating the airborne mist produced by traditional wet-machining.

We also have been pilot testing ways to save water at our cooling towers, which are one of the biggest water users at our plants. We’re trying new technologies that soften the water so that there are fewer salts to cause equipment scaling. This allows us to reuse the water through the cooling towers many more times before the hardness requires us to bring freshwater in, reducing the amount of freshwater needed for cooling processes and comfort cooling.

### Related links

#### This Report

➔ [Greening Our Operations](#)

In 2014, we are marking the 10<sup>th</sup> anniversary of the rebuilt Dearborn Truck Plant at the Ford Rouge Center, which was hailed as a model of sustainable manufacturing when we rebuilt it in 2004. The facility incorporates extensive natural stormwater management systems and what was then the largest green roof in the world. (Studies have shown that the roof has reduced runoff by 42 percent.) As we invest in new and existing facilities globally, we have built on what we learned at the Ford Rouge Center and put in place other sustainable manufacturing technologies that use water more efficiently and provide environmental benefits.

For example, in 2012, we replaced a portion of the roof at our world headquarters in Dearborn, installing 5,000 square feet of green sedum on the west side of the building. Our Louisville, Kentucky, and Cuautitlán, Mexico, plants installed porous pavement systems in the parking areas to reduce the amount of stormwater runoff. [Read more in the Environment section.](#)

## Water Assessments

While all of our plants measure incoming water use, we wanted to further define water usage within the plants. Therefore, we are conducting water assessments to help us gain a better understanding of our internal water usage. We began in 2012, hiring an outside consultant to conduct reviews at two assembly plants in the U.S. and one in Cologne, Germany. As of early 2014, we have conducted assessments at 12 global sites and continue to add new plants for assessment each year. We are in the process of evaluating the results to determine what measures can feasibly be taken to reduce water and save our company money at the same time.

The following plants have been evaluated under the project:

- AutoAlliance (Thailand)
- Changan Assembly 2 (China)
- Louisville Assembly (Kentucky, U.S.A.)
- Kentucky Truck Plant (U.S.A.)
- Cuautitlán Stamping and Assembly (Mexico)
- Hermosillo Stamping and Assembly (Mexico)
- Flat Rock Assembly Plant (Michigan, U.S.A.)
- Ohio Assembly (U.S.A.)
- Van Dyke Transmission Plant (Michigan, U.S.A.)
- Cologne Body and Assembly (Germany)
- Valencia Body and Assembly (Spain)
- Pacheco Stamping and Assembly (Argentina)



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# Operating in Water-Scarce Regions

Ford has been growing in many areas of the world where water access and availability are concerns. We have identified which of our operations are located in water-scarce regions using watershed-level data from the World Business Council for Sustainable Development's (WBCSD) Global Water Tool. Previously, we used country-level data in the Global Water Tool to analyze our operations. However, water availability is a local issue, and country-level data that averages the water availability across multiple watersheds may mask important regional variations. Therefore, we conducted the latest analysis using more detailed watershed-level data. According to our analysis, about 24 percent of our operations are located in regions that are considered to be at risk.

Our facilities in Mexico are located in water-scarce regions; our manufacturing facility in Cuautitlán, Mexico, for example, is already subject to water-withdrawal limitations. Several of our facilities in our Asia Pacific Africa region are in areas that are currently water scarce, or are expected to be in the near future.

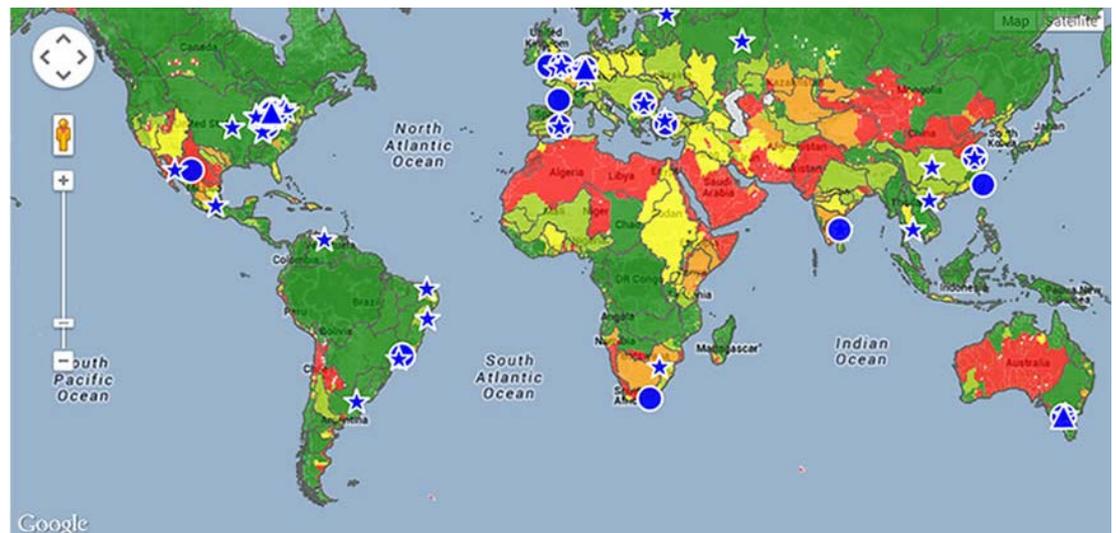
Ford also used the Global Water Tool to evaluate which of our operations are projected to be in water-scarce regions by 2025. According to the analysis, approximately 25 percent of our operations are projected to be in such regions. The WBCSD's free tool enables companies to map their facilities and assess several water-related risks. For more information on the tool and how it works, [see the WBCSD website](#).

### Related links

#### This Report

[Greening Our Operations](#)

## Ford Operations: 2025 Projected Annual Renewable Water Supply per Person



### Key: Water Scarcity

- No data
- Extreme Scarcity
- Scarcity
- Stress
- Sufficient
- Abundant

### Ford Locations

- Casting/Forging Aluminum Plants
- Assembly and Stamping Plants
- Engine, Powertrain and Transmission Plants

Source: World Business Council for Sustainable Development's Global Water Tool (GWT) v2 uses several datasets. Annual renewable water supply per person projections for 2025 are obtained from the Pilot Analysis of Global Ecosystems: Freshwater Systems. Washington DC: WRI produced by C. Revenga, J. Brunner, N. Henninger, K. Kassem and R. Payne (2000).



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# Water Impacts, Risks and Opportunities

Historically, water has been a relatively inexpensive resource. But that's changing, and the cost of using water is expected to continue increasing in the coming decades. For a manufacturing company like ours, that could mean higher operating costs.

From a business perspective, it is important to strategically reduce water consumption now, before we see significant price increases or the implementation of further water use restrictions.

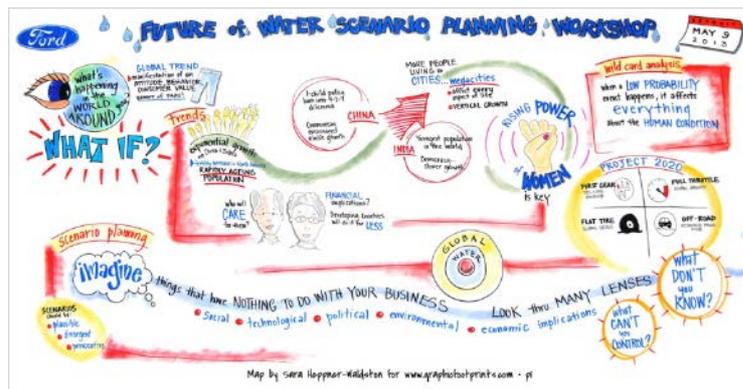
Increasing water scarcity means industrial needs can be at odds with community and environmental needs and could pose challenges to our commitments to both. Industrial facilities in water-scarce areas may have reduced access to water and/or may endure rising water costs. Working on solutions helps us to secure a "license to operate" in diverse global locations and can enhance our reputation in local communities.

As a company headquartered near one of the world's largest bodies of freshwater – the Great Lakes – it would be easy for us to take the resource for granted. In May 2013, we took steps to prepare for a water-scarce future, holding a "water futuring" workshop with approximately 20 participants, including outside stakeholders from universities and nongovernmental organizations, to examine "what if" scenarios about water in the years ahead. We wanted to uncover what the long-term implications are of water scarcity on Ford's manufacturing operations. Scenarios provide a tool to help us look outside our industry to understand shifts in social, technological, economic, environmental and political arenas. Since the future cannot be predicted, insights are derived by analyzing scenarios to influence strategy development. The idea is to contemplate multiple futures and develop sets of plans that work regardless of how the future unfolds.

During the workshop, participants talked through four scenarios for the year 2020. For example, what happens if water becomes a more precious commodity and resource, requiring governments to ration water allowances for agriculture? What would that do to food production? Or, what might a severe global financial crisis do to water infrastructure?

Following the water workshop, we began a gap analysis review of our current global manufacturing water strategy and will be updating it based on our findings.

The workshop may have set up fictional scenes for the future. But any one of them – not to mention plenty of others – have the potential to occur one day. We want to build resilient systems and processes that will help our company withstand any serious threats to future water insecurity. Thinking forward is critical if we want to proactively position our company for what may come ahead – both the possible challenges and opportunities.





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# Supply and Value Chains

Water is an important resource within our supply and value chains – from the makers of the parts and components that go into our vehicles to the dealers who sell our cars to the consumers who fill our vehicles with gas or diesel fuel, which require water to produce.

As part of our CEO Water Mandate commitments, we will work to reduce water impacts in our supply and value chains worldwide by:

- working with suppliers to understand the water intensity of raw materials;
- identifying and engaging suppliers in water-stressed regions where we operate, sharing water stewardship practices, and supporting actions to implement water efficiency improvements; and
- working with our dealership network on water-saving technology opportunities.

## Working with Suppliers

The nature of our business means that we are a large purchaser of water-intensive materials, parts and components. Like us, our suppliers face similar risks in terms of the increasing cost and competition for water and community concerns in water-scarce areas, and encouraging them to understand and manage their risks can help to make our supply chain more stable and resilient.

Beginning in 2014, we will start asking our major suppliers – those we consider to be Tier 1 – to voluntarily report on their water use through CDP Water as part of our efforts to better understand the water risks, implications and accounting within our supply chain. This builds upon the work we are already doing within the supply chain and is similar to the requests we already made of our suppliers for greenhouse gas emissions. We are asking both production and nonproduction suppliers who have been identified as having high water use and/or operate in highly water-stressed regions to complete the CDP Water questionnaire. The suppliers selected were based on literature-identified high water intensity materials and/or commodities such as the following:

- aluminum
- steel
- rubber
- carpets/textiles
- plastics
- coatings
- batteries/lithium

Once we understand which of our suppliers have the largest water footprints, we aspire to work with them to achieve reductions. Our goal is to teach our suppliers about the water savings initiatives we have implemented across our plants with hopes that they will implement some of our initiatives within their own facilities. These suppliers may, wherever feasible, take these successful initiatives and mirror them in other locations, and so on.

[See the Supply Chain section for more on our supplier work.](#)

## Working with Dealers

We have been working with our dealer communities on initiatives to help them save water (and energy) at their locations. Our [“Go Green” program](#) helps dealers improve environmental efficiency on their lots.

### Related links

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Voice: Brooke Barton

# Water Usages in the Vehicle Life Cycle

To better assess our water-related impacts, we have been working to quantify water consumption over the life of a typical light-duty vehicle in the U.S. The Georgia Institute of Technology's (Georgia Tech's) Sustainable Design and Manufacturing Program conducted a literature survey and analysis that included water used in material production, production of parts, vehicle assembly, vehicle use (fuel production and distribution) and vehicle disposal at end-of-life. Georgia Tech has also worked with Ford on a number of other multidisciplinary issues related to sustainable development.

The analysis found that the greatest water consumption occurs during the use phase. Although the car itself does not consume a lot of water, this is the most water-intensive period because of the water used to produce fuel. In the supply chain, the production and processing of materials (e.g., steel and aluminum) require the most water. Identifying which portions of the supply chain are most water intensive allows us to better assess the business risk associated with using suppliers in potentially water-stressed areas.

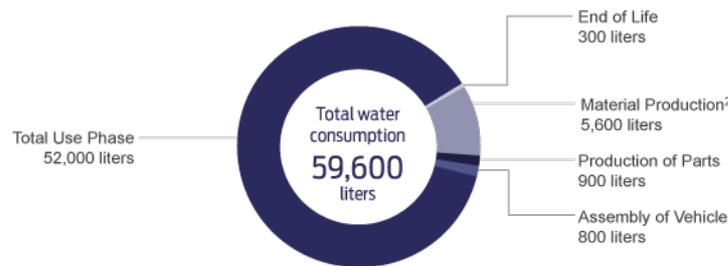
To improve our understanding of the water impacts from our products, we are currently estimating the freshwater withdrawal (i.e., use) and consumption for the life cycle of a model year 2012 Ford Focus. In this analysis, both direct and indirect water usages will be accounted for throughout the life cycle, based on a lifetime driving distance of 160,000 miles and the typical U.S. gasoline, E10, which includes 10 percent ethanol. A preliminary analysis has been completed. We will publish the results once they are verified.

### Related links

#### This Report

[Greening Our Products](#)

## Life Cycle Water Consumption<sup>1</sup>



Stage	Approximate Water Consumption (Liters)	Percentage
Material Production <sup>2</sup>	5,600	9%
Production of Parts	900	1.5%
Assembly of Vehicle	800	1.3%
Total Use Phase	52,000	87%
End of Life	300	0.5%
<b>Total</b>	<b>59,600</b>	<b>100%</b>

1. Source: B. Bras, F. Tejada, J. Yen, J. Zullo, T. Guldborg, Quantifying the Life Cycle Water Consumption of a Passenger Vehicle, SAE Technical Paper 2012-01-0646.

2. Indirect, upstream water consumptions were not included in the material production stage.

Water Consumption = Freshwater withdrawals that are evaporated

or incorporated in products and waste.

Water Use = All water that goes into a system. Most of this typically leaves the system as wastewater.

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# Collective Action and Public Policy

The water issue is a challenge too large for one company to tackle on its own. We must work toward large-scale collaborative action at the local, national and global levels if we want to identify and implement meaningful solutions. We are committed to continuous improvement through research and partnerships with other companies and organizations to develop improved best practices in responsible water stewardship.

We will collaborate with others, both public and private, to address water challenges (including access to water, sanitation and hygiene) while raising issue awareness by:

- striving to be recognized as an automotive industry leader within the core elements of the United Nations CEO Water Mandate;
- being actively involved in stakeholder platforms and efforts to address water challenges globally in the watersheds where we operate; and
- mobilizing positive action on water issues through efforts directed at employees, public and private stakeholders and the supply chain.

We also will collaborate with governments where we operate to promote sound water management practices for sustainability by:

- engaging with basin governance structures, where relevant, in countries and regions where we operate;
- collaborating with government affairs teams to tell our story and engage with governments on the formulation of regulation and the creation of market mechanisms to support water sustainability; and
- supporting water sustainability efforts in global and local policy discussions.

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# Community Engagement

For many years, we have demonstrated our commitment to sound water management in our own operations, focusing on water efficiency, effluent quality and water reuse. But we also are committed to moving beyond our own fence-line to address water issues within our communities in which we operate. We are working with stakeholders to better understand issues around access to water and sanitation, especially in water-stressed communities.

We're investing in water stewardship projects around the world, especially in areas where access to potable water is limited. As we expand into new markets in more water-stressed regions, we are increasing our engagement with local communities on water issues.

Through our CEO Water Mandate commitments, we will work within the communities where we operate, as appropriate by location, to facilitate access to water, sanitation and hygiene, and promote sustainable management of water resources by:

- using outreach opportunities, such as the [Global Week of Caring](#) and [Ford Volunteer Corps' seasonal initiatives](#), to support water stewardship;
- exploring innovative, market-based approaches to community water programs; and
- documenting our journey through our annual corporate Sustainability Report.

In 2013, we increased our focus on water-related projects by funding a number of projects, including ones that provide clean drinking water facilities in disadvantaged parts of China and India. About 19 percent of all of our Global Week of Caring projects focused on water.

Our Ford Motor Company Volunteer Corps, meanwhile, is placing a priority on water-based community projects during our Global Week of Caring and Accelerated Action Days. In 2013, the Ford Fund supported 23 water-related projects in Australia, Brazil, China, Germany, India, Malaysia, Mexico, South Africa and Thailand. Projects ranged from cleaning up waterways and coastlines to providing new water pumps that will bring clean water to schools.

### Rainwater for Humanity

In the Kuttanad region of Kerala, India, residents must walk miles to access water from a community tap for drinking, cooking and bathing. The other option is to purchase expensive water from unreliable vendors.

Engineering students at Brown University in Providence, Rhode Island, had another idea. Thanks to a \$25,000 grant from the 2013 Ford College Community Challenge, 50 locally made rainwater harvesting tanks will be built as part of the Rainwater for Humanity project, a joint initiative between Brown and the School of Environmental Sciences at Mahatma Ghandi University in Kottayam, India. The tanks, which will collect rainwater in a region known for its significant rainfall, will serve three to five families apiece.

The catchment is self-sustaining and works on a pay-per-use vending system. Revenue generated covers operating costs, offsets the initial investment, and creates additional capital for future projects. Brown intends for the design to provide potable drinking water to 1,250 residents of rural villages in the region by the end of 2014.

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[See the Communities section for more on Ford's volunteer programs.](#)



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# Data

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- E. [Process Wastewater Discharge](#)

View all data on this page as [charts](#) | [tables](#)

## A. Global Water Use per Vehicle Produced

*Cubic meters per vehicle produced*



	2008	2009	2010	2011	2012	2013
	5.7	5.7	5.0	4.7	4.2	4.0

Data managed through the [Global Emissions Manager database](#)

## Data notes and analysis

In 2013, we restated some historical data to account for divestiture of a facility.

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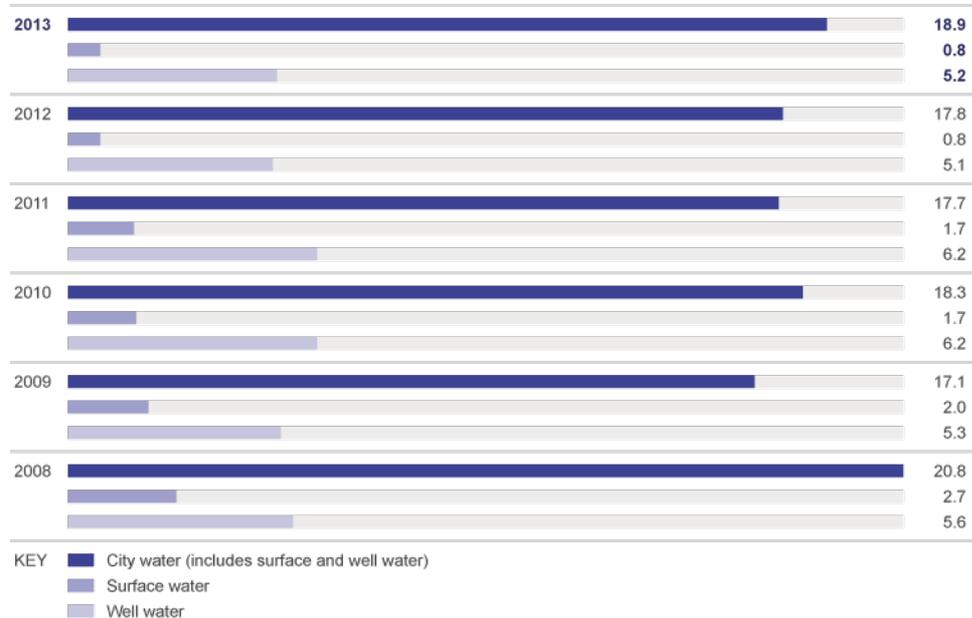
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## B. Global Water Use by Source

*Million cubic meters*



	2008	2009	2010	2011	2012	2013
City water (includes surface and well water)	20.8	17.1	18.3	17.7	17.8	18.9
Surface water	2.7	2.0	1.7	1.7	0.8	0.8
Well water	5.6	5.3	6.2	6.2	5.1	5.2

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#### Data notes and analysis

In 2013, we restated some historical data to account for divestiture of a facility.

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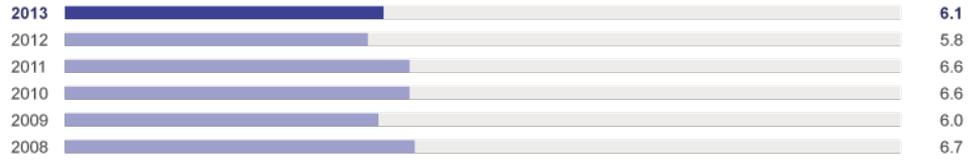
## C. Regional Water Use

*Million cubic meters*

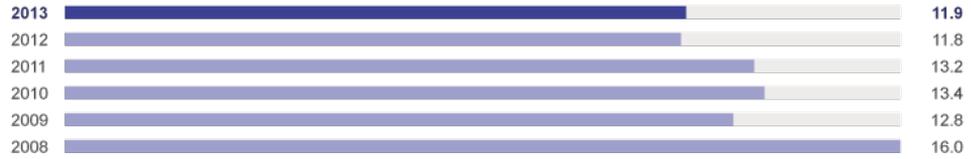
Asia Pacific Africa



Europe



North America



South America



	2008	2009	2010	2011	2012	2013
Asia Pacific Africa	3.9	3.4	3.6	3.5	4.0	4.8
Europe	6.7	6.0	6.6	6.6	5.8	6.1
North America	16.0	12.8	13.4	13.2	11.8	11.9
South America	2.5	2.4	2.5	2.4	2.1	2.1

|| Data managed through the [Global Emissions Manager database](#)

**Data notes and analysis**

In 2013, we restated some historical data to account for divestiture of a facility.

**Related links**

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**D. Re-use from On-site Wastewater Treatment Plant**

*Million cubic meters*



|| Data managed through the [Global Emissions Manager database](#)

**Data notes and analysis**

In 2013, we began tracking process wastewater discharge and water re-used from on-site wastewater treatment plants.

**Related links**

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## E. Process Wastewater Discharge

Million cubic meters

	<b>2013</b>
	<b>11.7</b>

 Data managed through the [Global Emissions Manager database](#)

### Data notes and analysis

In 2013, we began tracking process wastewater discharge and water re-used from on-site wastewater treatment plants. Process wastewater discharge does not include re-use of stormwater or sanitary.

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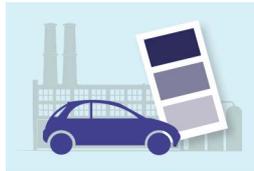
Voice: Brooke Barton

# Case Study: Ford Manufacturing Water Saving Technologies

Ford has already achieved its goal of decreasing water use per vehicle by 30 percent from 2009 to 2015. This graphic highlights some of the technologies that helped us reach our goal.

### 3-Wet Paint Technology

This technology enables consolidation of painting activities in an integrated booth, offering the potential to eliminate one booth water wash section, depending on plant design.



### Dry Paint Overspray System

This system eliminates water usage from the painting process, resulting in an 80 percent water savings for air conditioning/air tempering and 100 percent water savings from paint-over-spray separation, based on production volume of 158,000 units per year.



### Minimum Quantity Lubricant (MQL)

MQL uses an extremely small amount of oil versus conventional wet-machining. For a typical production line of 450,000 vehicles, MQL can save 282,000 gallons of water per year.



### Internal Water Metering

We are increasing usage of internal water metering to identify additional water saving opportunities and drive conservation behaviors to the department level. This has the potential to save approximately \$75,000 on average per plant globally.



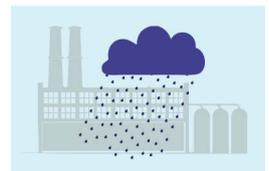
### Cooling Tower Technology

Cooling towers are one of the biggest users of water at our plants. We're using new technologies such as electrolytic water softening to increase cooling tower cycles of concentration, thus lowering water consumption.



### Sustainable Stormwater Practices

Where opportunity presents itself, we continue to utilize sustainable stormwater management practices, such as vegetated roofs and porous pavers.



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Case Study: Saving Water in Cuautitlán, Mexico

Voice: Brooke Barton

# Case Study: Saving Water in Cuautitlán, Mexico

Our manufacturing facility in Cuautitlán, Mexico, is located in a region of water scarcity. Although there is adequate annual rainfall, the arid region does not have sufficient infrastructure to recover the water, and the underground water table is dropping by an average of three to four meters each year. The government has been forced to pump in water from other states to ensure there is enough for the area residents.

When we first built the Cuautitlán Stamping and Assembly Plant in 1964, it was one of few large industrial manufacturers in the area. Today, Ford is one of many international corporations doing business here. Our neighbors include several global beverage producers and chemical companies that typically require far greater amounts of water than auto manufacturers.

In the 1990s, the regional Cuautitlán government recognized that demand for water was outstripping supply. Officials began placing limits on water withdrawals and requiring stricter permitting processes. We began paying much closer attention to our water use at the facility.

Over the years, facility managers have come up with some creative solutions to their natural environmental challenges, reducing water use per vehicle produced at this facility by almost 58 percent between 2000 and 2013.

One thing we did recently to conserve water was install dedicated piping for potable water to ensure that we did not use potable water for anything other than human consumption. All other water used at the plants gets recycled. The dedicated piping has improved the quality of water for drinking and for use in food preparation at our plant cafeteria.

Several times the plant has been recognized by Ford's Environmental Quality Office for its innovations. In 2013, for example, the plant won Ford's Latin America Environmental Leadership Award for an initiative using ecological concrete. The facility replaced the asphalt and parking lots within the plant with ecological concrete, which allows rain to reenter the ground. This recharges the aquifer beneath the plant and helps prevent water scarcity in the city. The plant renovated an area of more than 9,700 square meters with ecological concrete, allowing the absorption of as much as 7.5 million liters of water per year.

Not only was the project beneficial for the community, it was also beneficial for Ford's own bottom line. Ecological concrete is less expensive than traditional concrete and is maintenance-free. As a result, this has saved the plant approximately \$40,000 a year in maintenance costs.

The Cuautitlán plant employs a number of other technologies, systems and tools to reduce water usage, including the following:

- [3-Wet paint technology](#), which enables consolidation of painting to eliminate one booth water wash section. The technology also provides significant energy savings.
- We are using a new chemical process in pre-treating the vehicles in preparation for painting, which improves the quality of the vehicles while saving water and energy at the same time. By replacing phosphates with a process that uses zirconium oxide, we are saving approximately 1,000 cubic meters of water per month.
- We use recycled water to irrigate the landscaping around our plant. This includes a grass soccer field that is provided for the use of our employees.

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> **Voice: Brooke Barton**

## Voice: Brooke Barton

Director, Ceres Water Program

“Ford has an opportunity to demonstrate leadership around water because, quite frankly, the auto industry has been a bit slow in making the shift to the 21<sup>st</sup> century water mindset. It’s true that auto companies are not big direct users of water. But up and down its value chain, you see a far bigger footprint, from raw materials such as aluminum, which requires vast amounts of water to produce, to upstream water impacts of the fuels drivers use.”



The Ceres Water Program was launched in response to a recognition that global water trends – availability challenges, quality threats and climate change, to name a few – required a bold rethinking of future water use. Ceres felt that companies needed to look at these issues from a broader risk and opportunity lens and do far more to plan for a water-scarce future.

The Water Program began analyzing how global water trends and drivers intersect with businesses, supply chains and product development. And we examined ways in which companies were reporting and disclosing their water strategies. Was the disclosure comprehensive? What data were they using? How is the company managing these risks? Ultimately, we wanted to set a higher bar for best practice in water risk management.

In the five years since we began the Water Program, we’ve seen a dramatic shift in corporate understanding around water and its implications for business. I call this the 21<sup>st</sup> century water stewardship mindset versus a 20<sup>th</sup> century one. With a 20<sup>th</sup> century mindset, if I asked a facility manager where the water came from, she might point to the pipe in the back of a factory. Her knowledge about the source of the water – Does it come from an aquifer? Does it come from a river? Who are the other major users of that water? – might not go any deeper. For much of the 20<sup>th</sup> century, many companies had the luxury of ample and inexpensive water supplies, so they didn’t really have to think beyond the immediate source.

A business with a 21<sup>st</sup> century mindset views water as part of an interconnected ecosystem that is impacted by a host of variables, including changes in our climate. Water is understood to be a shared good that doesn’t just magically flow out of a pipe; it has a whole natural and engineered infrastructure supporting it – and in many places, a very fragile one at that. Ford Motor Company is among a growing number of companies undergoing this shift in mindset. It realizes that it not only needs to be more efficient in using water, but also needs to consider what it can do beyond its factory walls to protect fresh water for the future.

Ceres has had a relationship with Ford for more than a decade. Our independently convened Ceres Stakeholder Committee, which advises Ford on its sustainability reporting and strategy, has identified global water issues, including access to water in the developing world and overall stability of water supplies, as increasingly important to Ford’s business, especially as the company continues to expand into emerging markets.

The Stakeholder Committee has been active in bringing water concerns forward for Ford – even though it might not seem at first blush that water is a highly material issue for the auto industry. Recently, as Ford worked to expand its global water strategy, Ceres used our Aqua Gauge tool to assess Ford’s water stewardship approach, including the company’s water efficiency goals, and looked to see where there might be opportunities to strengthen and improve.

One of the key areas where we are pushing Ford is around supplier engagement and helping Ford’s strategic suppliers to understand their own water risks. Another key priority is encouraging Ford to look beyond the fence-line to improve stewardship of rivers and watersheds, especially in emerging market countries. We also wanted to see how Ford would implement its commitment to respecting the human right to water. In other words, how is Ford operationalizing that commitment by minimizing its own impacts on water while investing in projects that can make a real difference?

Ford has an opportunity to demonstrate leadership around water because, quite frankly, the auto industry has been a bit slow in making the shift to the 21<sup>st</sup> century water mindset. It’s true that auto companies are not big direct users of water. But up and down its value chain, you see a far bigger footprint, from raw materials such

as aluminum, which requires vast amounts of water to produce, to upstream water impacts of the fuels drivers use.

Companies like Ford should set water efficiency goals that prioritize water savings where water challenges are the biggest. A gallon saved in Michigan does not have the same environmental or social impact as a gallon saved in Mumbai. It's where a company is saving water that is the critical question.

One of the myopic ironies about water is that it tends to be cheapest in places where supply is most constrained. This perverse equation makes it difficult for companies to think of water as anything more than a monthly operating cost – and a cost that is minimal compared to energy use. But if companies only think of water in relation to price, then they're missing the full range of business interruption, supply chain and reputational risks. The value of water lies in assessing its opportunity cost – what would you do if it weren't available?

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