



THE BOEING COMPANY
2018 ENVIRONMENT REPORT



BUILD SOMETHING CLEANER



Cover photo: The 737 MAX 7 — 12 percent more energy efficient than the airplanes it replaces — is the newest member of the 737 MAX family. It began flight testing in 2018.

Photo above: Flowers and wind turbines sprout from the Wild Horse Wind and Solar Facility in central Washington State. The Puget Sound Energy facility generates a portion of the electricity that powers Boeing's 737 factory in Renton, Washington. Renewable energy sources generate 100 percent of the electricity used at the 737 factory and the 787 Dreamliner factory in North Charleston, South Carolina.

Boeing is the world's largest aerospace company. Every day, through innovation and commitment, the work of more than 140,000 employees across the United States and in 65 countries is helping build a more sustainable future for our industry and our planet.

The commitment is seen in products and services that deliver market leading energy efficiency. In 2017, Boeing delivered 933 commercial and military aircraft to customers across the globe, products that set the standard for reductions in fuel use, emissions and community noise.

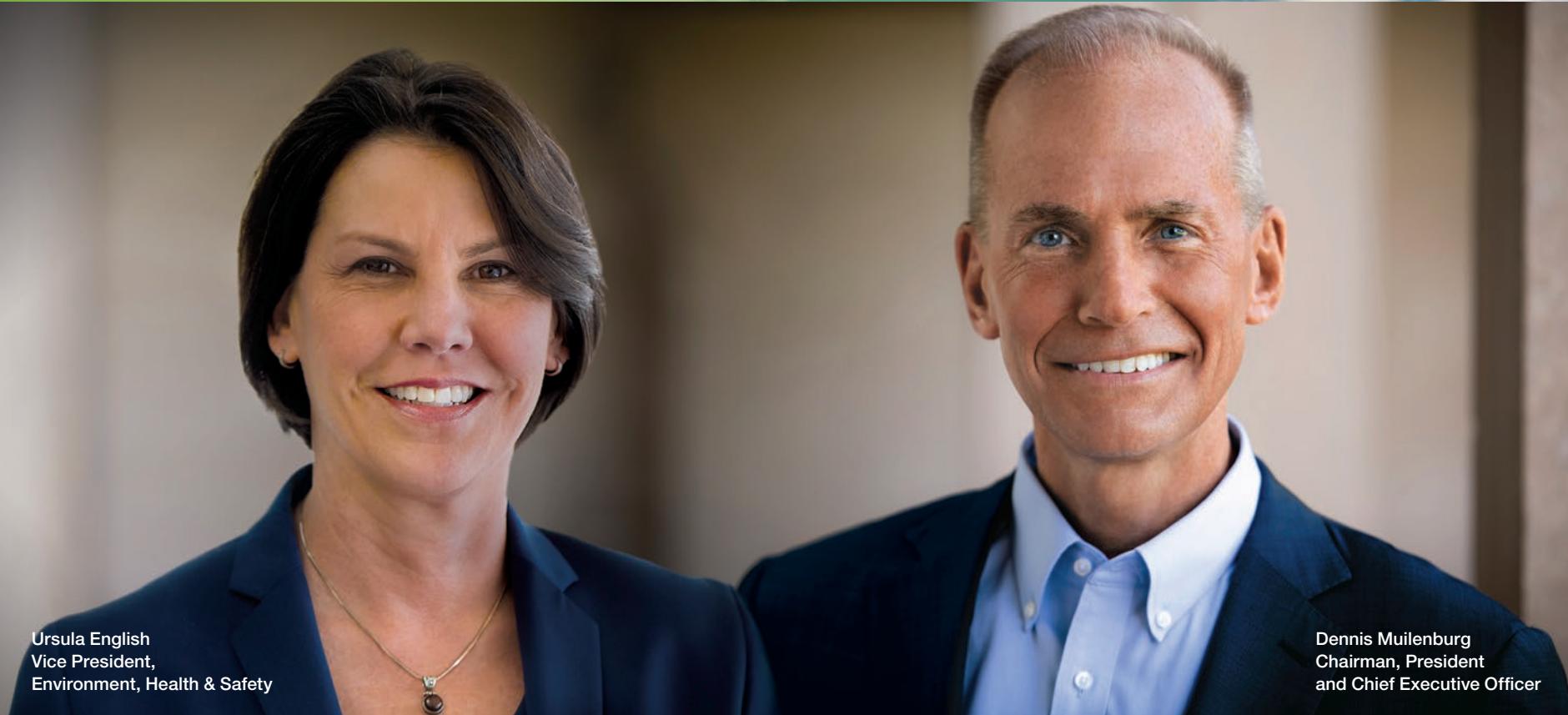
The operations of our factories, offices and other facilities in 2017 surpassed targets for resource conservation, further improving our environmental performance and footprint. As we continue the research, development and testing of advanced technology with the potential for far-reaching environmental benefits, we pursue new sources of innovation through targeted venture capital investments.

This report also shares the stories of employees and partners whose leadership, creativity and dedication are making a difference in Boeing's aspiration to be the best in aerospace and an enduring global industrial champion.

With pride in our accomplishments to date and commitment to accelerate the progress, Boeing's goals and strategy will help strengthen the company's global environmental leadership and enhance lives and communities where we live and work around the world.

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Ursula English
Vice President,
Environment, Health & Safety

Dennis Muilenburg
Chairman, President
and Chief Executive Officer

At Boeing, we're committed to innovation — in the products and services we create, the processes and technologies we develop, and the ways in which we work together.

This focus is important as we aspire to be a top performer in all areas of our business — including the environment.

Over the past five years, we've exceeded our goals for reduced greenhouse gases, water use, hazardous waste and solid waste sent to landfill.

From 2007 to 2017, we reduced greenhouse gas emissions 29

percent while growing our business and increasing aircraft deliveries by 71 percent. Our twin-aisle 787 Dreamliner and new single-aisle 737 MAX commercial airplanes are setting higher standards for fuel-efficiency and emissions.

Looking ahead, we have a bold new environment strategy to guide our business through 2025, which you'll learn more about in this report.

Our new strategy advances our commitment to invest in cleaner technologies, such as hybrid-electric propulsion, biofuel and chemical alternatives, which we continue to test with our [ecoDemonstrator](#) program.

Additionally, through our Boeing [HorizonX innovation cell](#), we're building on our momentum by investing in promising startups that

use transformative manufacturing methods and technologies, including advanced batteries and alternative-propulsion aircraft.

We'll make progress as well by continuing to partner with research institutions, customers, nonprofits and governments to develop new technologies, solve challenges, and educate and inspire communities about the importance of environmental responsibility.

This is an exciting time in our industry — with arguably more innovation underway than ever before. By continuing to innovate whenever and wherever possible, and through the dedication of our people who volunteer their time and talent in our communities, Boeing is helping to create a brighter, more sustainable future for generations to come.



Dennis Muilenburg
Chairman, President and
Chief Executive Officer



Ursula English
Vice President
Environment, Health & Safety

This report contains “forward-looking statements” within the meaning of the Private Securities Litigation Reform Act of 1995. Words such as “may,” “should,” “expects,” “intends,” “projects,” “plans,” “believes,” “estimates,” “targets,” “anticipates” and similar expressions are used to identify these forward-looking statements.

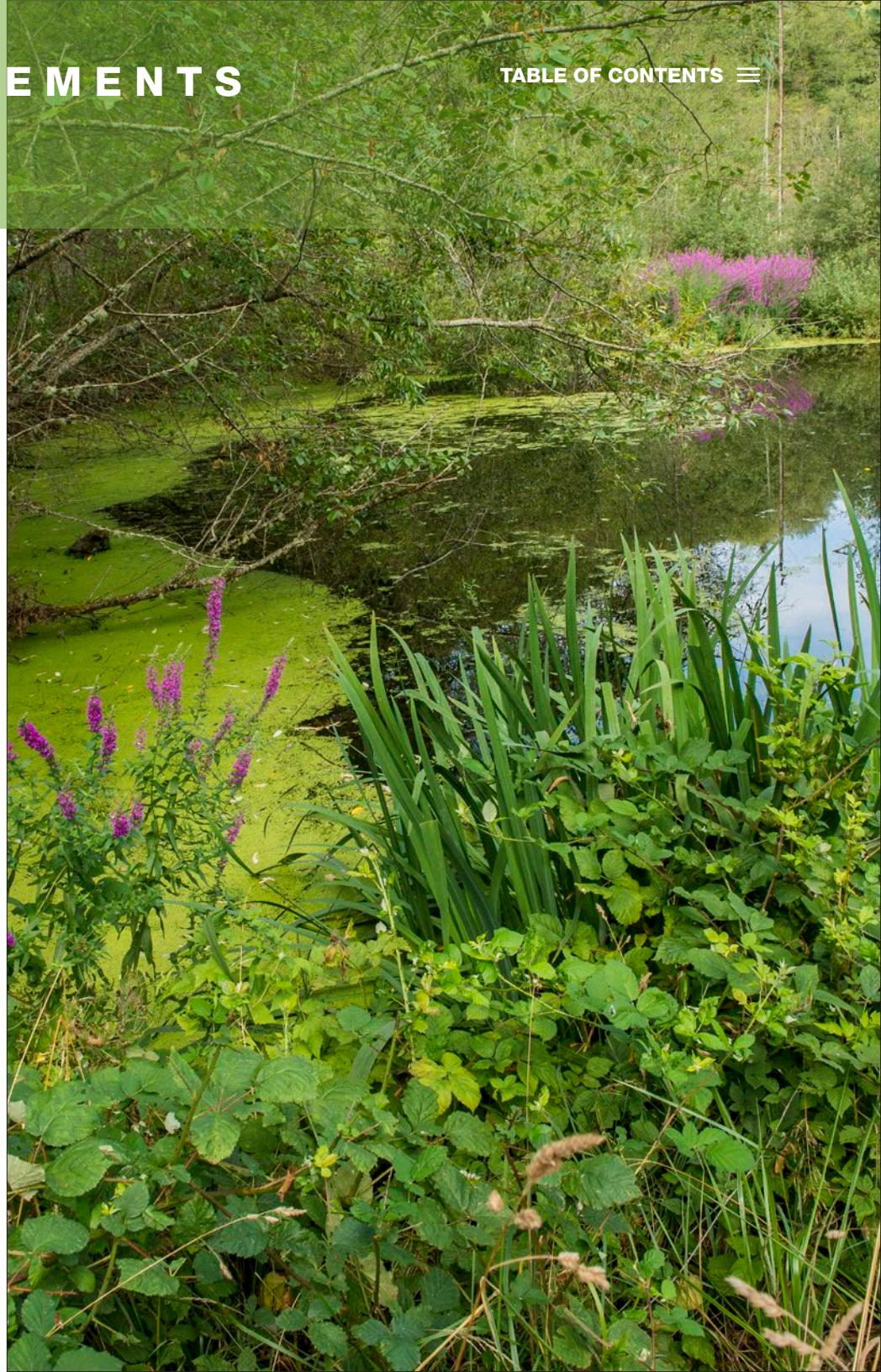
Examples of forward-looking statements include those relating to our future financial condition and operating results, as well as any other statement that does not directly relate to any historical or current fact. Forward-looking statements are based on our current expectations and assumptions, which may not prove to be accurate.

These statements are not guarantees and are subject to risks, uncertainties and changes in circumstances that are difficult to predict. Many factors could cause actual results to differ materially and adversely from these forward-looking statements.

Additional information concerning these and other factors can be found in our filings with the Securities and Exchange Commission, including our most recent Annual Report on Form 10-K, Quarterly Reports on Form 10-Q and Current Reports on Form 8-K.

Any forward-looking statement speaks only as of the date on which it is made, and we assume no obligation to update or revise any forward-looking statement, whether as a result of new information, future events or otherwise, except as required by law.

Wetlands are a part of stormwater management at Boeing's Everett, Washington, site.



DRIVING POSITIVE COMMUNITY CHANGE

John Blazey

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Our Homes: Boeing and the Environment

At Boeing, we believe our place in the world is here, right now. We invest, innovate and invest again in efforts that build, enhance and contribute to the social fabric of our world. Through our charitable giving efforts, Boeing has a long and proud history of supporting environmental initiatives in communities all across the globe.

Over the past 10 years, Boeing and The Boeing Charitable Trust have contributed a combined \$57 million in charitable giving to environment-related organizations — this includes more than \$4.7 million in matching contributions for employee cash donations and hours volunteered.

Our Employees: Enhancing Our Impact
Boeing employees



John Blazey sees the human face of Boeing's strategy to build a more sustainable future.

As leader of [Boeing Global Engagement](#), Blazey helps guide company resources, including charitable giving and employees' donated time and skills, to projects that make a difference in the lives of people and communities around the world.

"Each one of us has an obligation to help create and sustain healthy communities, both where we work and outside of the walls of our factories and offices," Blazey said.

Through direct grants, community partnerships and employees' volunteer time and energy, Boeing supports projects that protect stormwater, restore habitat, and promote sustainable use of resources in 16 countries around the globe.

Boeing's commitment to a healthy environment and more sustainable future, combined with employees' "seemingly endless capacity to give," create a powerful force for positive change, Blazey said.

"We all have a new perspective of our world, our place in it and our obligation to honor its beauty and importance to human life."

lead with passion and commitment. Each year, thousands of Boeing employees, retirees, family members and friends gather to support environment-related projects around the globe by contributing their time, money and skills.

In 2017, Boeing employees and retirees contributed nearly \$900,000 to environment-related organizations through the company's

employee-driven giving programs. Over the past 10 years, their total financial support reached \$8.6 million, enabling countless critical projects in our local communities. In addition, the Boeing family went beyond financial support and turned values into action by volunteering together during Earth Day, World Environment Day and at other personally meaningful activities.



Boeing's environmental strategy is guided by a comprehensive review and assessment of the most significant environmental challenges and risks facing the company.

The analysis included direct input and perspectives from diverse stakeholders — such as customers, environment-focused non-governmental organizations (NGO) and the company's global leadership — as well as research into industry best practices and community requirements.

This assessment helped Boeing identify and update our understanding of current and emerging sustainability issues that are critical to the company and our stakeholders. It also informed our next-generation environmental strategy and targets.

Most Significant Environmental Risks and Opportunities

The assessment analyzed diverse viewpoints and organized

environmental risks by level of priority as identified by Boeing and its external stakeholders. The risks relate to products, operations and a variety of other issues. Several risks and opportunities were named highest priority by both Boeing and our external stakeholders:

- **Products** Greenhouse gas (GHG) emissions; fuel efficiency, operational efficiency, and sustainable aviation fuel.
- **Operations** GHG emissions; energy conservation; water management; solid waste management/waste to landfill.

Boeing included additional high-priority risks and opportunities — such as managing hazardous materials over the product life cycle

in our operations and managing chemicals in aircraft production — as well as opportunities like pursuing innovations in alternative materials and environmentally progressive buildings.

External stakeholders added supply chain practices and reporting and mitigating product noise as high environmental priorities.

The relative ranking of environmental risks helps shape priorities, but we will address all identified issues in our global environmental strategy.

Global Environmental Trends

The assessment reported current and emerging global trends that may affect Boeing's business, including climate change, resource

scarcity, rapid urbanization, regional collaboration on environmental regulations and rapid innovation in new technology.

Environmental Leadership

The analysis concluded that Boeing has in place the policies and governance to address the most significant environmental risks the company faces. Opportunities to strengthen our leadership include improving the measurement and reporting of progress made to environmental goals, with increased transparency in communication to all stakeholders. Work is underway in these areas.

Internal and external stakeholders help shape Boeing's most significant environmental priorities. The results are shown below, in order of importance and influence on business strategy.

Results of Stakeholder Analysis Prioritization Study

- CO₂ emissions in products
 - Fuel efficiency
 - Operational efficiency
 - Sustainable aviation fuel
- Operations greenhouse gas emissions
 - Energy conservation
- Climate adaptation
- Operations water management
- Operations solid waste management and landfill
- Chemicals and hazardous material management
- Materials innovation and sustainable building
- Supply chain environmental standards, practices and reporting
- Airplane community noise
- Remediation and restoration
- Transparency in reporting
- Product end-of-service disassembly and disposal
- Non-greenhouse gas emissions
- Biodiversity
- Impact of transportation infrastructure



Small reusable plastic containers at an Everett, Wash. site facility will be shipped back to a supplier instead of being sent as trash to a landfill. It's one of the conservation and waste reduction projects that are reducing Boeing's environmental footprint.



Global Environmental Landscape

Aviation is an integral part of modern life. It links people, communities, cultures and countries around the globe. The air transport industry today supports an estimated 62.7 million jobs and \$2.7 trillion in global gross domestic product (GDP), according to the Air Transport Action Group.

Aviation also affects the planet and our shared global environment.

As the industry continues to grow, Boeing recognizes that pollution, natural resource scarcity and climate change are serious issues that require credible actions and global solutions.

The United Nations (U.N.) estimates that the world's population hit 7.6 billion in mid-2017 and adds another 83 million people every year. By 2030, the population will reach 8.6 billion, and increase to nearly 10 billion people by 2050.

A growing population and urbanization will further boost global demand for transportation, with the industry being challenged to meet the demand without a corresponding growth of emissions, community noise or other potentially harmful environmental effects.

Employees assemble the F/A-18 Super Hornet at Boeing's St. Louis, Missouri site. The Super Hornet in 2010 became the first U.S. Navy aircraft to demonstrate the use of a biofuel made from a 50/50 blend of camelina and JP-5 aviation fuel. The Green Hornet, as it is known, has been honored three times with a Chief of Naval Operations environmental award.

SECURING SANTA SUSANA'S OPEN SPACE

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Stephen Thor Johnson

"We are experiencing the most rapid changes in our global environment since humans evolved as a species," said Stephen Thor Johnson, president of North American Land Trust.

"My colleagues and I are inspired and motivated to take meaningful steps to keep our environment healthy and resilient, with projects that can be models and inspiration for others to follow."

Through an agreement between Boeing and the [North American Land Trust*](#), a national nonprofit land conservation organization, about 2,400 acres (971 hectares) within the [Southern California Santa Susana Field Laboratory](#) will be forever protected from residential and agricultural development, regardless of future ownership. The property is home to a number of sensitive species and serves as a wildlife corridor ensuring the

viability of animal species that depend on the ability to move throughout large territories. The property also includes important cultural resources, including Native American archaeological sites, which are protected by the conservation easement.

In addition to Boeing's ongoing progress with cleanup and site restoration, the transformation of Santa Susana is well underway, with native plants and animals reclaiming most of the previously developed areas of the field laboratory. Santa Susana is home to more than 16 plants and animals that are either endangered, rare or a special species of concern. The site includes unique plants such as the Braunton's milkvetch and the Santa Susana Tarplant, which serve as critical habitat for pollinators and other animal species.

"The opportunity to collaborate with Boeing to conserve such a significant tract of wildlife habitat and cultural and historic resources is a once-in-a-lifetime opportunity. To do so within an hour's drive of 20 million people is simply extraordinary. The value of this open space will be magnified over the coming decades and be remembered as a truly visionary act like the creation of Central Park or the conservation of the Presidio."

*See Endnotes



WORKING TOGETHER AS CLEAN TECHNOLOGY LEADERS

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Fuel of the Future

Scientific studies show that biofuel — made from waste cooking oil, purpose-grown sustainable crops that don't compete with food and land resources, and other sources — reduces life-cycle emissions up to 80 percent compared to fossil fuel.

Development has progressed significantly

since Boeing, Virgin Atlantic and other partners first tested biofuel in 2008. Five production pathways have been approved and airlines have flown more than 120,000 passenger flights on a blend of biofuel and regular fossil fuel.

Boeing works on six continents to expand development. Through



Boeing, Alaska Airlines and the Port of Seattle collaborate on the goal of powering all flights at Seattle-Tacoma International Airport with sustainable aviation fuel. (Alaska Airlines photo)

Numerous efforts at Boeing have been historic “firsts,” helping move the aerospace industry toward a more sustainable future.

Developing technologies like biofuel, which lower carbon emissions up to 80 percent, are essential in reducing aviation greenhouse gas emissions.

Boeing has been a leader in creating industry partnerships to promote the development and use of biofuel. Boeing helped organize the first biofuel test flight in 2008 by Virgin Atlantic on a Boeing 747, using a biofuel blend, illustrating the potential

for industry-wide collaborations for a more sustainable future.

In 2016, the first commercial flights using biofuel in Africa, with South African Airways and its sister airline, Mango, on Boeing 737s, proved that countries with developing economies can also lead in clean technology. Today, Boeing works with stakeholders on six continents to develop, commercialize and integrate biofuel into airports.

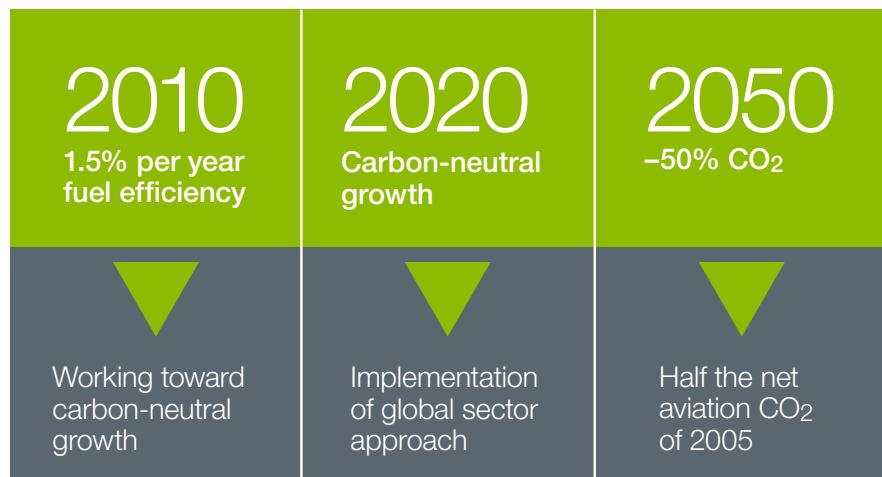
Boeing's ecoDemonstrator program, now in the fifth iteration, serves as a test bed to develop other technologies designed to enhance the safety, efficiency and environmental sustainability of future airplanes. The 2018 ecoDemonstrator, a FedEx Express Boeing 777, marked the first time a commercial aircraft flew 100 percent biofuel.

our partnership with Sunchem SA and SkyNRG, for example, farmers in South Africa are growing nicotine-free tobacco that's converted into biofuel. We're supporting LanzaTech a company that makes biofuel from steel mill waste industrial gases.

We're also working with several fuel producers to gain approval of renewable

diesel, a sustainable fuel widely used in ground transportation. We verified performance of the fuel, called HEFA+ in aviation, on our 757 and 787 ecoDemonstrator flight-test airplanes. Annual production capacity could meet more than 2 percent of global aviation demand at a price that's competitive with fossil-based fuel.

Collaboration is key to meeting the aviation industry's CO₂ reduction goals.



Commercial Aviation Carbon Reduction Goals*

Boeing is committed to a healthy environment and more sustainable future as the aerospace industry adapts to changing market forces.

Environmental Regulation

The numbers of regulations and environmental concerns affecting the aerospace industry are increasing and include the following:

- Greenhouse gas (GHG) emissions.
- Airplane community noise.
- Local air-quality emissions for products and factory operations.
- Chemical restrictions in manufacturing operations and product content.
- Water quality issues, such as stormwater.
- Hazardous waste.
- Energy consumption and the use of renewable energy in operations.

Chemicals and Regulatory Restrictions

Global regulation of chemical substances continues to grow. To illustrate, regulations expanded 50 percent per year from 2003 to 2013 — more than 50 times overall. That trend continues as efforts to reduce chemical exposure from consumer products affect more industries, including aerospace.

Commercial Aviation and Climate Change

Aviation contributes approximately 2 percent of global CO₂ emissions, according to the U.N.'s Intergovernmental Panel on Climate Change. New global agreements reached in 2016 support achieving the industry-established goals and a global sectoral approach to controlling emissions:

- A fuel-efficiency performance standard for aircraft.
- A global market-based measure system called Carbon-Offsetting and Reduction Scheme for International Aviation (CORSIA).

Implementation of these agreements into regulatory frameworks around the world is underway.

Customer Requirements

The aviation industry's business goals of providing safe, cost-efficient travel and environmental goals of reducing CO₂ emissions are both achieved by constantly improving airplane fuel efficiency. Reducing emissions is aligned to our customers' strategic desire to decrease fuel use, a major cost and priority in their purchasing decisions. Our customers increasingly require that Boeing's products and services include environmentally progressive attributes that will help them address environmental concerns without sacrificing performance or increasing life-cycle costs.

SUPPLIERS AIMING FOR A SUSTAINABLE FUTURE

Norimasa Takagi

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“The environment is a key policy for Nabtesco as a winning solution that ensures sustainable, long-term growth of our company and community,” said Norimasa Takagi, president of Aerospace Company, Nabtesco Corporation.

As Boeing’s 2016 Supplier of the Year Environment Award winner, Nabtesco* has built a great partnership with Boeing by supporting flight control components and systems and hydraulic equipment for aircraft. Like Boeing, Nabtesco recognizes the importance of a sustainable future and aims to improve environmental performance by focusing on CO₂ reduction and zero emission of hazardous chemicals through overall business operations. The company recently enhanced its environmental performance by achieving a 50 percent reduction in CO₂ emissions.

“Whether developing or maintaining our products, we encourage our employees to think about the environment,” said Takagi. “We continually strive to have a positive impact on both people and the world around us and have committed ourselves to act socially responsible at all times.” Nabtesco also shares Boeing’s vision for engaging employees in voluntary activities to benefit the environment and has committed to actively promote initiatives for sustainable improvements and energy, resource and recycling efficiency.

*See Endnotes

PARTNERSHIPS FOR PRESERVATION

Ashley Demosthenes

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"I have always had a personal calling to protect the environment, in particular the Lowcountry of South Carolina," said Ashley Demosthenes, president and CEO of Lowcountry Land Trust.

"I grew up in Charleston, which I consider one of the most beautiful cities on Earth," said Ashley Demosthenes. "Our partnership with Boeing resulted in one of the most successful conservation projects in our history as an organization," she said.

After expanding into South Carolina, Boeing worked with several state, federal and local agencies, including the [Lowcountry Land Trust*](#), to preserve about 4,000 additional acres (1,619 hectares) of habitat, containing 2,000 acres (809 hectares) of wetlands and native plants at risk. Once wetland enhancement activities are complete, this land will go to the United States Forest Service and the South Carolina Department of Natural Resources, ensuring long-term public access.

"Boeing has been an invaluable partner in the Lowcountry. Not only do they share our passion for the protection of special places and overall quality of life, they are committed to developing innovative solutions and growing partnerships that promote economic development and the protection of special places. We truly want the same things — and community collaborations help us find solutions to our most pressing issues," Demosthenes said.

*See Endnotes



Boeing's Environmental Milestones and Accomplishments 2008–2018



The 787 Dreamliner family uses 20 to 25 percent less fuel than the airplanes they replace.

A population roughly equal to Chicago flies on a commercial airliner somewhere in the world every day. While the number of air travelers grew 64 percent during the past decade — to 4 billion in 2017 — carbon-dioxide emissions increased at less than half that rate.

Aviation accounts for about 2 percent of global carbon dioxide emissions; four-fifths of aviation emissions come from flights for which no practical transportation alternative exists.

Boeing's commitment to foster sustainable air travel focuses on aviation's four-pillar strategy to stop

2008

Boeing and aerospace leaders commit to carbon-neutral growth and the aspiration of halving carbon emissions.

Flying a 747, Virgin Atlantic makes the first sustainable aviation fuel flight on a commercial aircraft.

First flight of a manned aircraft that is powered by hydrogen fuel cells.



All major manufacturing sites are certified to meet ISO 14001 environmental management standard.

Boeing is a founding member of the Sustainable Aviation Fuel Users Group.

Boeing's first five-year conservation and waste reduction targets are set.

DRIVING BETTER FUEL EFFICIENCY

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the growth of emissions by 2020 and halve them by 2050 compared to 2005 levels.

Flying Farther on Less Fuel

The foundation of sustainable air travel begins with our highly efficient airplanes. Two new Boeing jetliner families have entered service in the past decade and a third begins flight testing next year. All three represent step-change improvements in efficiency and capability over their predecessors.

The 787 Dreamliner family — meeting market demand for optimal range and capacity while using 20 to 25

percent less fuel than the airplanes it replaces — has enabled airlines to efficiently fly passengers on more than 170 new routes.

The 737 MAX uses 20 percent less fuel than the airplanes it replaces and is as efficient as a hybrid electric car (in terms of equivalent liters of fuel used per 100 passenger kilometers). The MAX is part of the 737 family, which is the best-selling commercial jetliner in history and used on nearly one-third of all airline flights.

The 777X, which enters service in 2020, will be the world's most efficient twin-engine jet.



Boeing rolled out its 10,000th 737 — a 737 MAX 8 — in March 2018. Guinness World Records recognized the 737 as the most-produced commercial jet airplane of all time.

Chromate-free paint primer is used on the Apache helicopter.



2009

787 Dreamliner has its first flight.



Boeing begins implementing LEED Silver or higher standard for all new construction and major renovation projects in U.S.



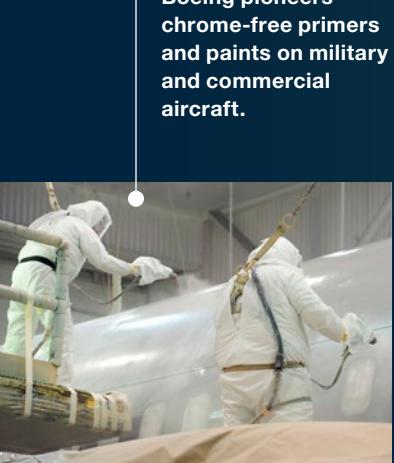
2010

Boeing, The Nature Conservancy and the College of Charleston mitigate environmental impacts of the final assembly and delivery center at Boeing South Carolina.

Environmental requirements are added to contracts for Boeing suppliers.



With composite wings and highly advanced engines, the 777X will reduce fuel use and emissions 12 percent over the airplanes it replaces.



Boeing pioneers chrome-free primers and paints on military and commercial aircraft.

Groundbreaking is celebrated on new Portland metal-treatment facility, which will significantly reduce cadmium use in manufacturing.

201



Boeing begins project to restore fish habitat and shoreline along Seattle's Duwamish Waterway, part of an EPA Superfund site.

Boeing is a founding member of the International Aerospace Environmental Group, developing a standard approach to supply-chain environmental issues and innovative solutions for the aerospace industry.

Boeing South Carolina (BSC) and Boeing Philadelphia sites send zero waste to landfills; BSC is powered entirely with renewable electricity, including solar panels on final assembly building.



The new 747-8 and 787 Dreamliner enter service. Compared with the airplanes they replace, they are cleaner, quieter and more fuel efficient: the 747-8 has 16% better fuel efficiency, and the 787 uses 20–25% less fuel.

Direct Routes scans real-time operations to ensure optimization continues throughout the flight. Pilots receive advisories on more efficient routings that arise because of changes in wind, air traffic and other factors.

Similarly, Wind Updates provides timely information to pilots to help them take advantage of the most efficient route or altitude.

Maximizing Airspace Use

We also equip our airplanes with technologies to take advantage of modernized air traffic control systems, including satellite-based navigation. In collaboration with the industry, we're helping to bring those

INNOVATING CAPABILITIES FOR A CLEANER FUTURE

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systems into use on the FAA's Next Generation Transportation System (NextGen), Single European Sky and other initiatives.

Global, Collaborative, Sector-Wide Approach to Regulations

The International Civil Aviation Organization (ICAO) took two historic actions in 2016, representing the world's first sectoral commitment to address climate change. The UN agency's work began 10 years ago with technical support from Boeing and other stakeholders.

ICAO adopted a carbon-offsetting system that will help aviation stop the growth of CO₂ emissions from

2020 onward. Seventy-three member states have agreed to participate so far, representing nearly 88 percent of international flights.

ICAO also adopted the world's first industry-specific, global CO₂ emissions standard for aircraft certification. Boeing's 787 Dreamliner, 737 MAX and 777X were designed to meet the challenging requirements and help fulfill the standard's goal to reduce emissions.

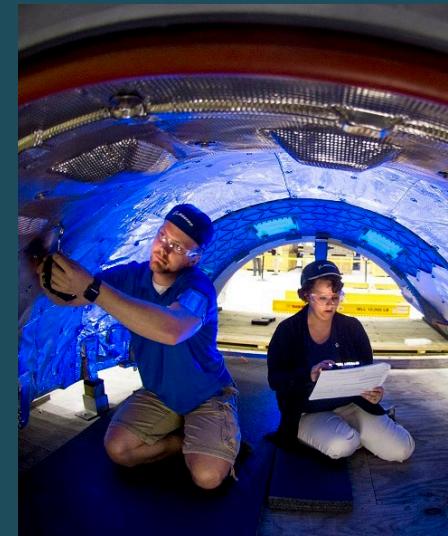
Accelerating Innovation

Boeing's ecoDemonstrator flight-test program plays a key role in our efforts to speed up technology development that will enhance

airplane situational awareness and improve operational and environmental performance.

Since 2012, the ecoDemonstrator program has researched more than 60 other technologies using a 737, 757, 787 and Embraer E170 as test platforms. Redesigned Advanced Technology winglets tested in 2012 are now used on the 737 MAX.

This year the program tested more than 30 technologies aboard a 777 Freighter, including a Boeing-designed and built compact thrust reverser that could enable a future for larger, more efficient engines.



A new compact nacelle — the housing for a jetliner's engine — will help enable advanced engines that reduce fuel use and emissions. It's being tested on the 2018 ecoDemonstrator 777 Freighter.

Boeing launches the 737 MAX, which uses 20% less fuel than the airplanes it replaces.



Hydrogen- and solar-powered aircraft are developed to aid military and reconnaissance missions.



Boeing-led industry efforts win ASTM International approval for aviation biofuel. ASTM sets global fuel standards for commercial and military aviation.

Boeing receives its first EPA ENERGY STAR Partner of the Year award for 2010 performance.

2012



Boeing receives major EPA leadership award for restoring the former Chemical Commodities Inc. Superfund site in Kansas, providing valuable pollinator habitat.



First flight of the unmanned, high-altitude Phantom Eye, powered by clean-burning hydrogen.



Nearly 90% of the content in retired aircraft is recycled, much of which includes reusable parts, which are resold to airplane operators under regulations enforced by the U.S. FAA and European Aviation Safety Agency.

Beyond the Final Flight

Boeing supports responsible airplane retirements as a key element in our life-cycle approach to environmental performance. As a founding member of the Aircraft Fleet Recycling Association (AFRA), we've worked with AFRA and other stakeholders over the past decade to develop best practices that have significantly improved end-of-life sustainability.

Owners retire about 600 commercial airplanes a year, and nearly 90 percent of the content by weight is reused or recycled. Boeing and the industry are now focused on reducing waste from carbon-fiber composites, which are used in newer airplanes such as the 787 Dreamliner and 777X.



Construction is completed on state-of-the-art, award-winning storm-water treatment systems at the Santa Susana Field Laboratory site.

Several Boeing sites implement a program for employees to recharge personal electric vehicles while at work.

Boeing hits 5-year performance targets, saving enough energy to power 44,000 U.S. homes for a year and reducing greenhouse gas emissions enough to equal to removing 87,000 cars from the road for a year.

2013



Boeing launches the new 787-10 and 777X, which are more fuel efficient than the airplanes they replace. The 787-10 is 20–25% more efficient and the 777X is 12% more efficient.

Production begins on the 702SP, the world's first all-electric-propulsion satellite.

Largest habitat restoration in Lower Duwamish Waterway is completed, transforming nearly one mile (1.6 km) of former industrial waterfront into a wetland that improves Puget Sound salmon runs.

El Segundo is the latest site to achieve zero waste to landfill.



IMPROVING ENVIRONMENTAL PERFORMANCE

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Protecting People, Driving Environmental Performance

The drive for constant improvement has underpinned Boeing's defense and space products, and how they're built, for the last decade.

On Earth Day in 2010, an F/A-18 Super Hornet took off from Naval Air Station Patuxent River, Maryland, to become the first U.S. Navy aircraft to demonstrate the use of a biofuel made from a 50/50 blend of camelina and JP-5 aviation fuel. The

Green Hornet, as it was known, was honored that year and two others with a Chief of Naval Operations environmental award, one of many U.S. Department of Defense honors bestowed upon Boeing for its environmental stewardship and performance.

In 2016, the KC-46A Pegasus was named the Department of Defense's top large program in environmental excellence in weapon system acquisition. The U.S. Navy honored the P-8A Poseidon in the same



Boeing drives for constant performance improvement in all of its defense and space products, including the Chinook helicopter.

2014

The second airplane used in the ecoDemonstrator program, which tests emerging technologies, makes the world's first flights using green diesel, a renewable fuel common in ground transportation.

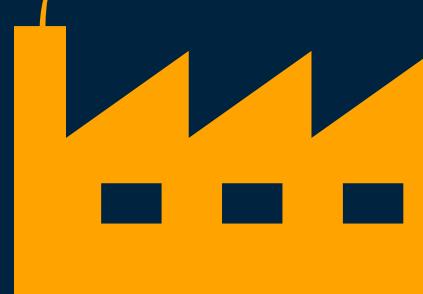
Thousands of roof-top solar tubes help heat Boeing Salt Lake's new LEED Silver-rated paint facility.



Boeing collaborates with America's Cup winner ORACLE TEAM USA on recycling 7,000 pounds (about 3,175 kg) of carbon fiber from the America's Cup 2003 campaign.

2015

The 737 factory in Renton, Washington is powered by 100% renewable electricity, including wind energy.



Enhanced recycling, including composting, is introduced at major U.S. sites; over 78% of Boeing's solid waste is diverted from landfills.



Comprehensive wetlands mitigation plan preserves 4,000 acres (1,600 hectares) of land near South Carolina site.



The F/A-18 Super Hornet has been honored three times with the U.S. Navy's Chief of Naval Operations environmental award.

category a year before and in 2013. Boeing's efficient products extend from sea to space as well: from our line of all-electric propulsion satellites to autonomous marine vehicles powered by the sun and waves.

A number of Boeing Defense, Space & Security sites have also been honored for improvements in operations. From California to Alabama, multiple jurisdictions and groups have noted Boeing's efforts to reduce water consumption, energy usage and solid and hazardous waste.

For example, Boeing helped Maricopa County meet an EPA air quality target by finding ways to reduce dust kicked up by its rotorcraft on the flight line of its factory in Mesa, Arizona. At Boeing's satellite factory in El Segundo, California, we installed a system to capture and filter stormwater hitting the parking lots before releasing it into the ground, thereby replenishing the underground aquifer there. In St. Charles, Missouri, Boeing is using solar panels to power water pumps, lights and rooftop exhaust fans.

Defense, Space & Security also has a number of employee groups focused on the environment. In 2016, when Boeing celebrated its centennial, two such groups were able to mark at least 100 completed projects. The Sustainables in Puget Sound and Boeing Employees for Environmental Protection (BEEP) in St. Louis have been active over the last decade cleaning creeks and beaches, hosting recycling events and educating employees on environmental topics.

Boeing supports research to help small-scale bio-fuel feedstock producers in Sub-Saharan Africa meet economic and other standards for bringing their crops to the biofuel market.	Boeing supports environmental and other causes with \$76 million in charitable donations.	2016	Sediment and shoreline cleanup and restoration along the Lower Duwamish Waterway at former Plant 2 site near Seattle is completed.	Research collaboration shows high potential for permeable pavement, a porous paving material that enables the natural filtering of stormwater.
Employees and their families take part in 178 events across 15 countries as part of Earth Day and World Environment Day.	30,000 employees, about 20% of the workforce, save money while cutting emissions by choosing alternative commuting methods.			

Improving Environmental Footprint of Facilities

Boeing's commitment to improving its environmental footprint can be seen at hundreds of factories, offices and other facilities around the globe. Our employees have made conservation of energy and natural resources a way of doing business for decades.

For example, the company's energy consumption in 2017 was essentially the same as it was in 2007, even with the company's growth from \$66.4 billion in annual revenues to \$93 billion — a 41 percent increase.

Annual airplane deliveries rose 71 percent.

The U.S. Environmental Protection Agency has recognized Boeing's environmental performance with its ENERGY STAR Partner of the Year award for eight consecutive years (2011 to 2018).

Two Boeing sites use 100 percent renewable electricity: Renton, Washington, home of the 737, and Boeing South Carolina, which uses 16,000 solar panels on the roof of its final assembly building to generate up to 2.6 megawatts of renewable energy — 20 percent of the site's

requirement. When it came online in 2011, the South Carolina solar-energy system was one of the largest solar arrays in the nation and doubled the state's solar power generation.

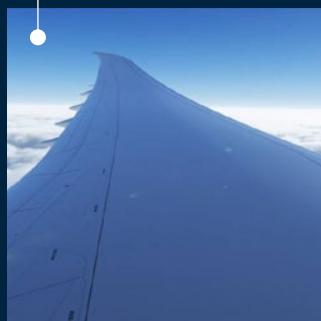
Boeing has applied LEED building standards to all new construction and major renovation projects since 2008. Fourteen Boeing facilities are rated LEED Gold.

Boeing is a leader in advancing green stormwater infrastructure; 25 systems have been installed in California and Washington to improve stormwater quality.

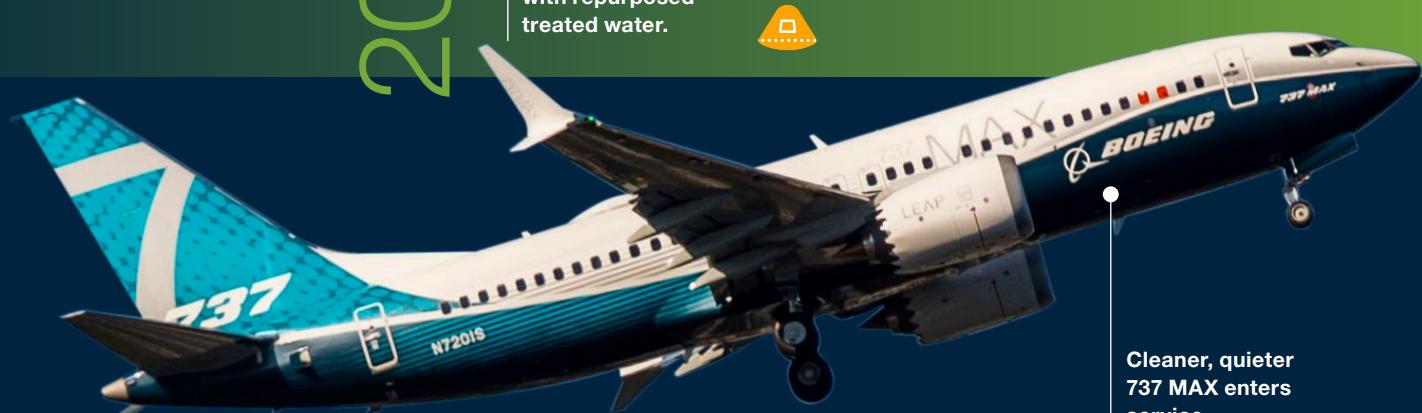


Elk share the terrain with wind turbines at the Wild Horse Wind and Solar Facility in Washington State. The Puget Sound Energy facility generates electricity that helps power Boeing's 737 factory in Renton, Washington.

NASA recognizes Boeing's collaboration for the ecoDemonstrator 757 testing of several advanced technologies and for improvements in blended wing body and structures.



ecoDemonstrator program tests 60 advanced technologies on four airplanes in the past five years.



2017

25 million gallons (95 million litres) of water are saved at Huntington Beach, California, campus by irrigating with repurposed treated water.



More than 50 Boeing sites globally are certified to the high standards of the ISO 14001 environmental management system.

Cleaner, quieter 737 MAX enters service.



An employee inspects parts being prepared for corrosion-resistant paints. Boeing is researching environmentally responsible alternatives to chemicals that face possible restrictions around the globe.

Safer Processes for People and Environment

Boeing's Chemical Technology team finds innovative solutions that make airplane production processes safer for people and our environment.

One of these creative solutions, the Boegel coating system, has reduced the amount of Boeing's paint-related wastewater by more than 400,000 gallons since 2011.

Boeing Senior Technical Fellow Kay Blohowiak helped develop Boegel, which is water-based, does not generate wastewater and maintains durability over time. "Developing more environmentally friendly chemical processes helps improve the company's environmental footprint, manufacturing safety and delivers a better, safer product overall," Blohowiak said. Whenever the Boegel system is used, it also eliminates the use of hexavalent chromium in the conversion coating layer.

Boeing Research & Technology (BR&T) is developing new, more environmentally progressive paints and coatings that speed up the painting process. BR&T is studying the use of innovative technologies, such as laser ablation, that can reduce hazardous chemical usage and eliminate the ergonomic injuries associated with abrasive sanding of surfaces.

The Santa Susana Field Laboratory site in Simi Valley, California, is secured as permanent open space.



2018

Boeing receives the ENERGY STAR Partner of the Year award for the eighth consecutive year (2011 to 2018).



BTP Halon replacement for aircraft cabin fire extinguishers is delivered to first customer, SilkAir, on 737 MAX.

The 2018 ecoDemonstrator airplane, a 777 Freighter, will include the first 100% biofuel-powered flight on a commercial jet.



DRIVING EFFICIENCY, OPTIMIZING OPERATIONS

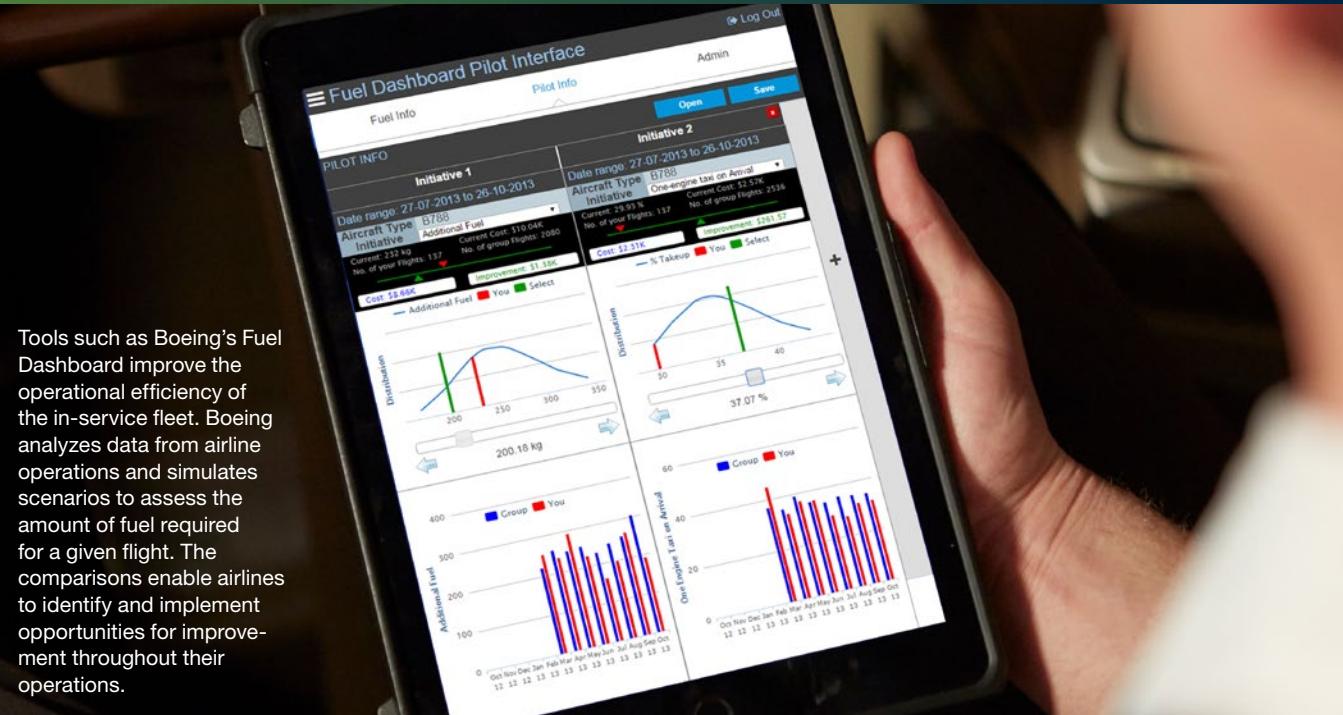
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In July 2017, Boeing launched a third major business unit, Boeing Global Services, which combined the majority of services capabilities, including Boeing subsidiaries Aviall and Jeppesen, into one services-focused business.

With a focus on innovative services in engineering, digital aviation and analytics, supply chain logistics, and training support, Global Services delivers solutions that can drive efficiency, optimize operations and improve our environmental performance.

Boeing, through its subsidiary Jeppesen, offers services that enhance airplane efficiency by using data analytics and real-time information. Services such as Fuel Dashboard, Direct Routes and Wind Updates help airlines optimize routing based on weather, air traffic and other factors. Jeppesen works with more than 120 airlines and corporate flight departments, reducing fuel use an average of 4.3 percent.

Additionally, Jeppesen provides digital flight operations solutions to airline representatives to improve situational awareness on the ground and in the air as well as increase fuel savings through the elimination of paper-based material weight. Through these new services and guidance from Jeppesen, our goal is to eliminate paper and transition to a fully digital operating environment.



Tools such as Boeing's Fuel Dashboard improve the operational efficiency of the in-service fleet. Boeing analyzes data from airline operations and simulates scenarios to assess the amount of fuel required for a given flight. The comparisons enable airlines to identify and implement opportunities for improvement throughout their operations.

One of Aviall's locations in the Netherlands also has made environmental performance a competitive advantage by obtaining authorizations to safely and compliantly provide critical aerospace chemicals within the European Union. Our Aviall team continues to work with suppliers and customers to support research and development of environmentally preferred materials and processes.

Boeing Global Services supports sustainability activities in its operations across the globe. Examples include implementing lighting controls to conserve energy, enhancing the recycling program to reduce landfill

waste and reusing packaging materials in distribution centers.

The Kent-Benaroya Distribution Center in Washington State has developed several packaging reuse strategies that have reduced its environmental footprint and lowered business costs. In 2017, this program saved more than 42,000 pounds (19,050 kg) of waste, with the additional benefits of conserving natural resources and reducing life-cycle energy and packaging material waste.

One specific project created a "packing pillow" using packing material that was considered too

small or not suitable to reuse alone. The packing pillow allowed the site to reuse more than 18,000 pounds (8,164 kg) of packaging material in 2017.

Along with conservation efforts, the Spares Distribution Center in Washington State manages its Industrial Stormwater Permit with the assistance of a bioswale, which slows and filters runoff from the 27-acre (109,265 sq m) facility. It has assisted the facility in maintaining compliance with its stormwater permit for the past seven years.

INCREASING PUGET SOUND'S GREEN INFRASTRUCTURE

Mike Stevens

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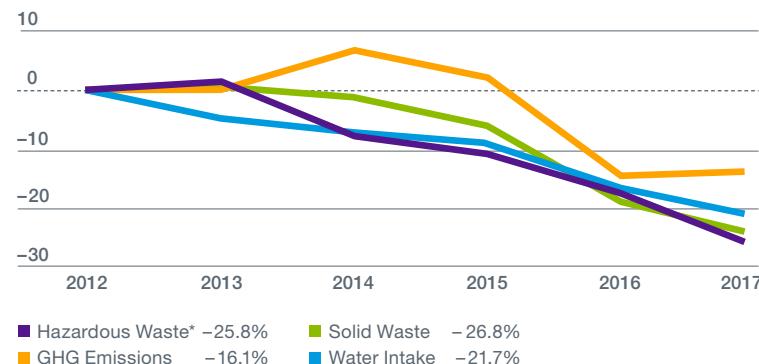
"I love connecting with people all over our state. I relish discovering our shared values and a vision of a world where people and nature both thrive," said Mike Stevens, Washington State director of The Nature Conservancy.

"Whether I'm talking with farmers, tribal members, community leaders, outdoor recreationalists, high-tech workers, parents or CEOs, the drive to innovate and find solutions to our biggest threats and toughest problems brings us together and creates an exciting and productive dialog," Stevens said. Boeing provided the seed funding for [The Nature Conservancy](#)* to launch its cities program in Puget Sound. The program is focused on bringing increased green infrastructure into Puget Sound's cities and towns in ways that enable clean water and air to support human well-being. Boeing's commitment to advancing solutions for cleaner water in Puget Sound has encouraged the nonprofit, private, research and government sectors to come together around a common vision to use nature-based solutions for cleaner water and healthier communities. "I'm inspired by the idea that we can all make a difference. Small actions matter and so do big ones. Together we can solve problems that look insurmountable. I love knowing that the work I am doing matters to our future and our planet," Stevens said.

*See Endnotes

Boeing surpassed the environmental performance targets in the five-year reporting period ending in 2017.

Environmental Performance
(Percent Performance to 2012 Baseline)



*Normalized to revenue

From 2012 to 2017, Boeing generated fewer greenhouse gas emissions, used less water, sent less solid waste to landfills and generated less hazardous waste—all reduced from 14 to 26 percent. The significant improvements came during a time of unparalleled growth in our business, with record airplane deliveries. The people and projects driving Boeing's environmental progress are profiled and highlighted throughout this report.

As you will see in the next section, starting this year, Boeing has implemented new, more aggressive environmental performance goals through 2025, demonstrating an ongoing commitment to strengthening our global environmental leadership.

Some of the data in this year's Environment Report reflect the U.S. Environmental Protection Agency's (EPA) 2018 new release of the national year 2016 eGRID emissions factors, which represent the emissions footprint of all electric power sources. We apply the new factors to the previous two years. A significant decrease in the emissions factor was identified for the whole nation. This was mainly caused by

reduction of coal-derived electricity under EPA's Clean Power Plant Program. To ensure data accuracy and reflect reality, Boeing recalculate the 2016 and 2017 data, which caused a decrease of the emissions previously calculated and reported for those years. We substantially exceeded all goals.

Boeing's environmental performance data is verified by an independent third party and reviewed by the CDP. In 2017, Boeing earned a CDP rating of A-minus.

The accompanying graph shows data rounded to the nearest decimal point and reflect the environmental performance of the majority of Boeing facilities, calculated against 2012 baseline values. (Hazardous waste generation targets are revenue adjusted.) Boeing also submits environmental data to regulatory agencies and voluntary disclosure organizations, such as Australia's National Greenhouse and Energy Reporting Scheme, the United Kingdom's Carbon Reduction Commitment Energy Efficiency Scheme, and the European Union's Emissions Trading System.



THE FUTURE IS BUILT HERE

Boeing subsidiary Aurora Flight Sciences is developing an autonomous electric vertical-takeoff-and-landing (eVTOL) aircraft that will decrease emissions and noise while operating as a safe, on-demand urban air transportation vehicle—one example of Boeing's efforts to shape the future of mobility.

Between now and 2025, a new environment strategy will guide Boeing's aspirations to be the best in aerospace and an enduring global industrial champion.

This approach strengthens Boeing's environmental leadership as it continues to

- Provide innovative products and services to improve environmental performance for our customers and aerospace industry.
- Strive for excellence in sustainability for our operations and supply base.
- Inspire collaboration with partners around the world to advance

innovative solutions for local and global environmental needs.

The strategy outlines aggressive environmental goals and performance targets for guiding many aspects of the company's business through 2025: striving to reduce greenhouse gas emissions by 25 percent, aiming to lower water consumption and solid waste sent to landfill by 20 percent, and aspiring to decrease energy consumption by

10 percent and hazardous waste generation by five percent

Looking ahead, the new approach focuses on environmental priorities and needs facing Boeing. This means the strategy is not about the next eight years, but about Boeing shaping the future for the kind of company it needs to be and world it wants to build for future generations.



Boeing's new environment strategy has three central focus areas:

Innovate for Performance



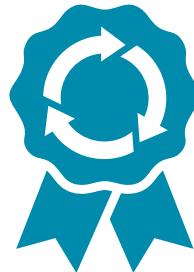
Through innovation in design, manufacturing and operations, Boeing aims to reduce the lifecycle environmental footprint of its products. Environmental requirements will be designed in for cleaner products in each phase of product manufacturing and service life. Addressing our environmental footprint from the beginning to the end of service is

important for providing manufacturing solutions including greater energy efficiencies while working toward eliminating hazardous chemicals in production processes.

A focus on cultivating valuable partnerships, like those developed within Boeing's HorizonX ventures, allow for advancement of science and environmentally progressive

innovations. Boeing's acceleration of advanced technology and product development, including investigating small electric or hybrid electric aircraft, continued support of large-scale biofuel usage, and proactive management of chemical restrictions in the aerospace industry are only a few ways we plan to innovate for performance.

Excellence in Sustainability



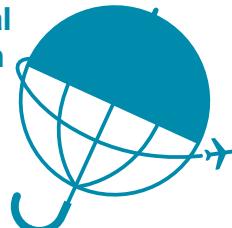
Boeing looks to improve the environmental performance of its operations by setting aggressive targets for reducing greenhouse gas emissions, energy and water use, hazardous waste generation and solid waste sent to landfill. (See chart on the next page.) Boeing also works with suppliers by setting environmentally responsible

requirements. Our strategy includes collaboration with the aerospace supplier base to promote sustainable manufacturing and operations practices, and allow us to work together toward a common goal of improving the aerospace industry's environmental performance.

Achieving excellence in sustainability through this new strategy builds upon

Boeing's long-standing commitment to excellence in cleaning and restoring at-risk sites affected by past practices. By setting an example as a global leader, we will grow our commitment to protect human health and the environment while complying with all relevant global environmental rules and regulations.

Inspire Global Collaboration



The new strategy embraces and builds on Boeing's strong partnerships with community environment leaders ensuring that projects support economic, social and environmental progress. Building on previous efforts between Boeing and organizations like The Nature Conservancy, Southern California's

TreePeople and the Lowcountry Land Trust in South Carolina will inspire other partners and customers. A focus on valuable collaborations helps Boeing deliver results.

Boeing employees invest countless hours of their time and talent in the communities where they live and

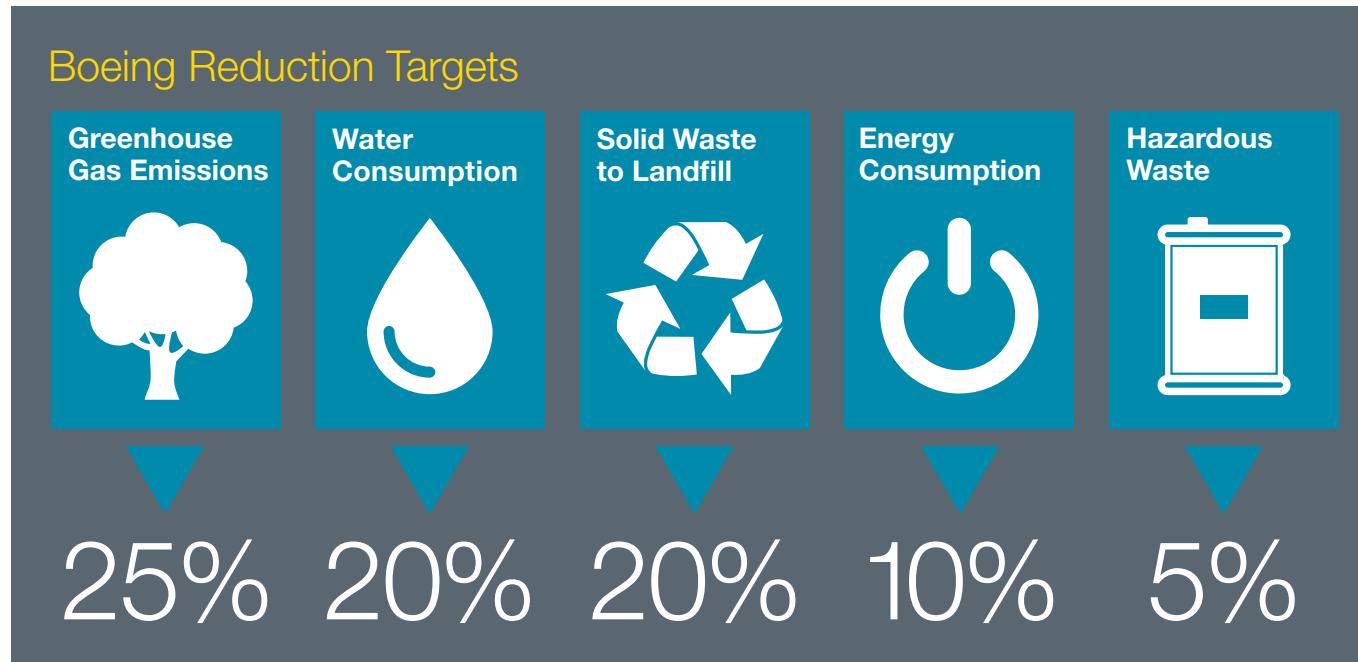
work. Through purposeful strategic partnerships, employee engagement and community investment, this new strategy allows Boeing and its employees to increase support of innovative environmental partnerships and programs to create value and build better communities worldwide.

Bold, new environment goals illustrate Boeing's commitment to improving the company's operational footprint by 2025.

Over the next eight years, Boeing's strategic investments and partnerships will inspire a global approach to achieving environmental standards.

The new strategy encourages and supports employees in identifying projects and actions where they can

lead with courage and passion — from the largest site to individual factory and office workers — to help Boeing conserve natural resources. By reaching higher, embracing change and uniting for a common goal, this strategy helps ensure a cleaner future is built here.



THE FUTURE OF TECHNOLOGY

Pradeep Fernandes

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Pradeep Fernandes doesn't mind disrupting "business as usual," especially when it comes to thinking about Boeing's future.

"My team evaluates segments of Boeing's core businesses that are ripe for disruption from emerging competitors; we need to disrupt ourselves before someone else does," Fernandes said.

Fernandes is a leader of Boeing HorizonX, the company's pathfinder organization that is making targeted investments in new ventures and startups and exploring disruptive innovations and business strategies. Early investments include game-changing technology, such as advanced batteries and hybrid-electric propulsion aircraft.

"Air traffic will continue to grow; we need to serve and lead the growth in an environmentally responsible way," Fernandes said. "It means increasing efficiency and reducing emissions, not just on current products, but also products of the future and emerging forms of commercial and urban mobility."

Although we can't see the future, "we can try to shape our future by deeply engaging in developing our technology and continuously adding new capabilities in our processes and products," he said. "By helping to shape the innovation journey, we're building a more sustainable future and supporting our continued success for another 100 years."

THE FUTURE OF SUSTAINABLE BUILDING STRATEGIES

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The 737 Completion & Delivery Center in Zhoushan, China will be a showcase of energy efficient and sustainable building strategies and a demonstration of Boeing's global commitment to environmental leadership.

The completion center is a joint venture between Boeing and Commercial Aircraft Corp. of China. When fully operational, it

will install aircraft interiors on 737 MAX airplanes bound for Boeing's Chinese airline customers. The aircraft will be painted on site and transferred to customers at the adjoining delivery center.

The facility features state-of-the-art energy efficiency and resource conservation strategies, including:

- Using recycled materials in the building's frame and interiors

- Providing onsite electric vehicle charging
- Retaining or evaporating 98% of site stormwater
- Using collected rainwater for 100% of landscaping irrigation
- Recycling 75% of waste
- Conserving resources with use of features like high-efficiency water fixtures and HVAC systems and LED lighting

- Using daylight to illuminate 75% of interior spaces
- Securing LEED certification

Boeing also worked closely with local governments on the facility's design and construction.

THE FUTURE OF ENERGY REDUCTION

Beth Gilbertson

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Conserving and Protecting a Valuable Natural Resource

Boeing saves millions of gallons of water every year with new technology and creative approaches to reducing overall water use and waste. Innovative materials also help manage and improve the quality of stormwater runoff from company sites.

A few examples: Boeing will save 22 million gallons

(more than 83 million liters) of water annually – a nearly 90 percent reduction – thanks to a new water recycling system at the Everett, Washington, Interiors Responsibility Center, which manufactures aircraft interiors. Boeing Portland uses reverse-osmosis technology to recycle and reuse 13 million gallons of water a year.

An innovative new material that shows great potential in improving the quality of stormwater runoff is moving from the laboratory to field tests in 2018. Permeable pavement is a porous paving material that allows stormwater to percolate through the surface to the soil below where the water is naturally filtered and pollutants removed.

It's hard to miss Beth Gilbertson's enthusiasm for her work as a utilities and conservation specialist at Boeing's 737 factory in Renton, Washington.

"Every day I have the opportunity to work with amazing teammates as we look for new ways to help Boeing reduce its energy and water use and reduce waste. I know we're making a difference in helping Boeing shrink its carbon footprint and move toward a more sustainable future," she said.

Gilbertson can bring together resources to support a wide range of recycling and conservation projects, from implementing lighting upgrades and supporting maintenance teams' conservation ideas to working with city utilities on finding water leaks.

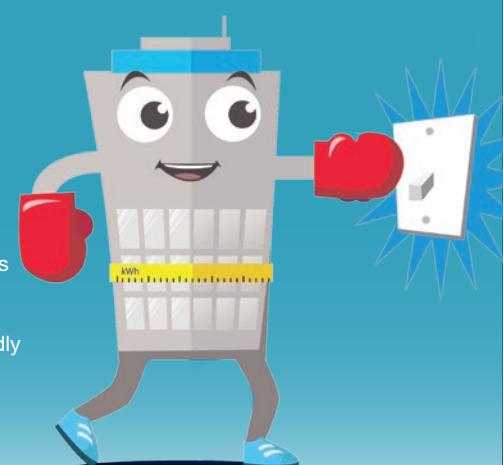
Her passion for the environment started early; her father was an engineer and her mother a teacher. "My father would share the challenges and solutions he faced in the energy industry; my mother instilled the values of being a life-long learner," Gilbertson said.

The early inspiration still moves her today. "We all can take an action or make a choice every day that will conserve resources and move us to a more sustainable future, at work and at home, too."

Boeing also works closely with community groups such as The Nature Conservancy on stormwater mitigation projects in Washington, California and other states.

In the 2018 Battle of the Buildings* (BoB), 47 sites in six countries helped Boeing reduce energy use. The format of friendly competitions among facilities will be used in future conservation campaigns.

*See Endnotes



THE FUTURE OF CLEANER FACILITIES

Mike Bunker

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As the leader of Boeing's largest manufacturing site outside the U.S., Mike Bunker points with pride to the innovation of his Aussie teammates in setting the course for a cleaner, more sustainable future.

"It's in simple steps, like eliminating disposable coffee cups to working with our local utilities on the possibility of installing solar panels to generate clean power on site," he said.

Bunker leads Boeing Aerostructures Australia (BAA), in Melbourne, which builds control surface parts, such as wing flaps and winglets, for most Boeing aircraft models.

The site has completed soil and groundwater remediation from operations that predate Boeing's ownership and stretch back to World War II. Bunker said BAA is following an aggressive strategy to reduce energy use and greenhouse gas emissions, conserve water, expand recycling and improve its manufacturing processes, while also continuing to grow and build more products.

"I love being a part of building more environmentally friendly aircraft, in factories that produce less waste, use less energy and leave the site better than how we found it. It's beautiful to me."





Our company's environmental strategy and policies are guided by the Environment, Health & Safety (EHS) Policy Council, composed of Boeing's Executive Council and led by the chairman, president and chief executive officer.

The Policy Council ensures that strategy and performance targets are set and monitored. A team of 20 executives across our businesses and product lines meets twice a month to advance our strategy and plan.

Reviews by the EHS Policy Council and a functional review with the chairman, president and chief executive officer are conducted twice a year. Progress and status

are reported through each of these venues in addition to other internal executive reviews across the company.

One Policy Council meeting each year is focused on setting targets that are aligned with corporate long-range business planning; another annual meeting focuses on detailed planning and reviewing the company's environmental and safety performance.

Environmental initiatives are embedded into every organization and function within Boeing. The EHS organization comprises functions focused on workplace safety and health, environmental performance and regulatory compliance. The EHS team also works with our business unit and operational leaders to drive an integrated, enterprise-wide strategy that addresses our products, services, processes, operations, contractors and employees.

This highly integrated and coordinated approach drives continuous improvement in the environmental performance of our products and operations around the world.

Endnotes for General Text

- **Page 9:** North American Land Trust (NALT) is a nonprofit land conservation organization that works throughout the United States. As of 2018, it has completed conservation projects in 20 states totaling over 120,000 acres. NALT's core competency is balancing conservation of significant natural and cultural resources with limited, compatible public and private uses.
- **Page 11:** Source: The Air Transport Action Group
- **Page 12:** Aerospace company Nabtesco Corporation provides major aircraft manufacturers with a variety of quality aircraft equipment, and is a global leader of flight control components and systems.
- **Page 13:** Lowcountry Land Trust is a 501(c)(3) nonprofit conservation organization focused on protecting ecologically, agriculturally and historically significant Lowcountry lands along South Carolina's coast—and the way of life they make possible.
- **Page 24:** The Nature Conservancy is the leading conservation organization working around the world to protect ecologically important lands and waters for nature and people. Since 1951, TNC has protected more than 119 million acres of land and thousands of miles of rivers worldwide impacting 72 countries addressing conservation threats involving climate change, access to clean water, ocean health and everything in between.
- **Page 32:** The Battle of the Buildings graphic is used with the permission of the U.S. Environmental Protection Agency.

Endnotes for Performance Summary Chart and Graph

- "Environmental fines" represent total fines paid in 2012, 2013, 2014, 2015, 2016 and 2017, respectively.

➤ Data reported in this chart for the greenhouse gas emissions, hazardous waste, water intake and solid waste to landfill reflect environmental performance at the following sites from a baseline set on 2012 values. These sites (known as Core Metric Sites) represent the vast majority of Boeing's operations and are identified by the city in which the Boeing operation resides. For each metric, additional facilities and office buildings also have been included where information is available.

- Alabama: Huntsville
- Arizona: Mesa
- California: El Segundo, Torrance, Huntington Beach, Long Beach, Seal Beach, Palmdale
- Illinois: Chicago
- Indiana: Gary
- Missouri: St. Charles, St. Louis
- Ohio: Heath
- Oregon: Gresham
- Pennsylvania: Ridley Park
- South Carolina: Charleston, Ladson
- Texas: Houston, San Antonio
- Utah: Salt Lake City, West Jordan
- Washington: Auburn, Bellevue, Tukwila (Developmental Center, Duwanish Towers), Everett, Frederickson, Kent (Space Center), Seattle (North Boeing Field, Plant 2, Thompson, South Park), Renton (737 Assembly, Longacres), SeaTac (Spares Distribution Center)
- Canada: Winnipeg
- Australia: Fishermans Bend
- Site changes: Anaheim, California (closed in 2012; 2012 data only); Bankstown, Australia (closed in 2013; 2012 and 2013 data only); Wichita, Kansas (reduced scope in 2015, now reports only hazardous waste).

Endnotes for Greenhouse Gas Emissions

- In addition to data from Boeing's 37 Core Metric Sites, data from Portland, Oregon (PDX Paint Hanger), and the Phoenix, Arizona, Data Center also included.
- 1 metric ton = 2,204.62 pounds.
- Carbon dioxide equivalent, or CO₂-e, means the number of metric tons of CO₂ emissions with the same global warming potential as one metric ton of another greenhouse gas (in accordance with EPA 40CFR98 Mandatory Greenhouse Gas Reporting).
- GHG emissions are calculated based on consumption of electricity, natural gas and fuel oil. (Our facility in Philadelphia is the only major U.S. site that uses No. 6 and other fuel oils for heating and curtailment backup.) Consumption of other fuels is not represented.
- 2016 emission numbers are recalculated based on new eGRID2016 factors.
- For U.S. sites, Scope 1 emissions from natural gas, fuel oil and on-site generated electricity are calculated using the emission factors provided in U.S. EPA GHG Mandatory Reporting Rule. Scope 2 emissions from purchased electricity are calculated using the market-based method and eGRID sub-region factors, since residual mix is not available in the U.S. For the Canada site, Scope 1 emissions are calculated using the emission factors provided in U.S. EPA GHG Mandatory Reporting Rule; Scope 2 emissions are calculated using the market-based method and the supplier-specific emission factor. For the Australia sites, Scope 1 emissions are calculated using the emission factors provided in the National Greenhouse and Energy Reporting (NGER) Scheme, and Scope 2 emissions are calculated using market-based method and the emission factors provided in the National Greenhouse and Energy Reporting (NGER) Scheme, since residual mix is not available in Australia. Emissions calculated with location-based method are: 1,247,000 tons (1,131,000 metric tons) CO₂e (2017). Emissions calculated with Market-based method are: 988,000 tons (896,000 metric tons) CO₂e (2017).
- RECs were applied to the GHG calculation for the following locations: North Charleston, South Carolina, and 6 Puget Sound locations in Washington. In 2017, these Boeing locations made arrangements to purchase RECs to offset around 125,000 tons (113,000 metric tons) of GHG emissions.

Endnotes for Water Intake

- In addition to data from Boeing's 37 Core Metric Sites, data from Portland, Oregon (PDX Paint Hangar), also included.
- 1 U.S. gallon = 3.79 liters.

Endnotes for Solid Waste to Landfill

- Includes data from Boeing's 37 Core Metric Sites.
- 1 U.S. ton = 2,000 pounds.
- Solid waste numbers represent values determined from scale-weighed containers as well as calculated weights.

Endnote for Hazardous Waste Generation

- In addition to data from Boeing's 37 Core Metric Sites, data from Portland, Oregon (PDX Paint Hanger); Jacksonville, Florida (Cecil Field); El Paso, Texas; Macon, Georgia; Wichita, Kansas; and Sylmar, California, are included.

Endnotes for Global Reporting

Australia National Greenhouse and Energy Reporting endnote: This comprehensive report must be completed by registered corporations that meet specified energy use and greenhouse gas emission thresholds. For the 2015–2016 reporting period, the Australian government's Clean Energy Regulator released data for companies emitting more than 55,000 tons (about 50,000 metric tons) of equivalent carbon dioxide (CO₂e).

United Kingdom Carbon Reduction

Commitment endnote: Boeing U.K. operations consist of multiple units and subsidiaries. Boeing U.K. Training and Flight Services Ltd. Operates flight simulators for training on Boeing aircraft at several locations throughout the U.K. Boeing Defense U.K. Ltd. has employees located at multiple locations throughout the U.K., supporting Ministry of Defense and U.S. military programs. Additionally, CO₂ emissions from Boeing subsidiary Jeppesen U.K. Ltd. and Aviall U.K. Inc. are included in the Boeing U.K. CRC report.

Endnotes for Greenhouse Gas Corporate Inventory

- The greenhouse gas (GHG) emissions reported represent 1,696 buildings in 42 countries where Boeing has operational control. Refer to the Site Listing Footnotes for Corporate GHG Inventory Chart for cities included.
- Scope 3 emissions only include emissions from business travel.
- Scope 1 “other gas types” include CH₄, N₂O, NF₃ and PFCs emissions.
- Scope 1 “other fossil fuels” include No. 6 fuel oil, gasoline, aviation gasoline, propane and LPG.
- 1 metric ton = 2,204.62 pounds.

➤ Carbon dioxide equivalent, or CO₂e, means the number of metric tons of CO₂ emissions with the same global warming potential as one metric ton of another greenhouse gas. (In accordance with EPA 40 CFR Part 98 Mandatory Greenhouse Gas Reporting Accounting protocol.) This GHG inventory is prepared using the following protocols:

- The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition)
- The Scope 2 Guidance
- GHG Reporting Guidance for the Aerospace Industry (IAEG)
- The Australian National Greenhouse and Energy Reporting Act 2007
- The United Kingdom’s CRC Energy Efficiency Scheme

➤ Scope 2 emissions are calculated using the market-based method. Location-based method calculated emissions are 988,000 tons (896,000 metric tons) CO₂e. Residual mix is only available in EU countries; therefore, other grid average emissions factors are used in all other countries. In the market-based methodology, RECs were applied to the GHG calculation for the following locations: North Charleston, South Carolina and 6 Puget Sound locations in Washington. In 2017, these Boeing locations made arrangements to purchase RECs to offset around 125,000 tons (113,000 metric tons) of GHG emissions.

➤ Other calculation factors: Data source of global warming potentials (GWP) is U.S. 40 CFR Part 98 subpart A, table A-1. For GHG inventory in North America, emission factors for combustion sources come from U.S. 40 CFR Part 98, subpart C, table C-1. For GHG inventory in the U.K., emission factors from the CRC Energy

Efficiency Scheme are used. For GHG inventory in Australia, emission factors from the National Greenhouse and Energy Reporting Act are used. For GHG inventory in locations where energy data are not accessible, 2012 CBECS factors are used to estimate the energy consumption and emission factors from the International Energy Agency's *CO₂ Emissions From Fuel Combustion Highlights 2013* and *2006 IPCC Guidelines for National Greenhouse Gas Inventories* are used to calculate the emissions.

Site Listing Endnotes for Corporate GHG Inventory Chart**Country State/City (Site)**

Country	State/City (Site)
Canada	
Alberta	Calgary
British Columbia	Richmond
	Vancouver
Manitoba	Winnipeg
Ontario	Mississauga
	Ottawa
Quebec	Mirabel
	Montreal
China	Beijing
	Hong Kong
	Shanghai
Denmark	Copenhagen
Egypt	Cairo
Ethiopia	Addis Ababa
France	Blagnac
	Paris
Germany	Berlin
	Bavaria
	Munich
	Hesse
	Neu-Isenberg
	North Rhine-Westphalia
	Cologne
Greece	N. Smirni
Hungary	Papa
India	Andhra Pradesh
	Hyderabad
	National Capital
	New Delhi
Belgium	Brussels
Brazil	São Paulo
	Sao José dos Campos

END NOTES

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Site Listing Endnotes for Corporate GHG Inventory Chart (cont.)

Country	State/City (Site)
India	Karnataka Bangalore
	Tamil Nadu Chennai
Ireland	Leinster Belfast Dublin
Israel	Tel Aviv
Italy	Rome
Japan	Chubu Nagoya Tokoname
	Tokyo Tokyo
	Kanto Yokohama
Kazakhstan	Almaty
Kenya	Nairobi
Luxemburg	Luxemburg
Malaysia	Kuala Lumpur
Mexico	Mexico City
Netherlands	Amsterdam Nieuw Vennep Schiphol-Oost, Noord-Holland
New Zealand	Auckland
Oman	Muscat
Poland	Gdańsk Warsaw
Qatar	Doha
Russia	Moscow Skolkovo Tyumen

Country	State/City (Site)
Saudi Arabia	Riyadh
Singapore	Singapore
South Africa	Johannesburg
South Korea	Seoul Yeongcheon-si
Spain	Madrid
Sweden	Göteborg
Taiwan	Taipei
Turkey	Ankara Istanbul
Ukraine	Kiev
United Arab Emirates	Abu Dhabi Dubai
United Kingdom	England Bristol Camberley Corsham Crawley Farnborough Feltham Fleet Gosport Knaresborough London Milton Keynes
United Kingdom	Oxford Welwyn Garden City Yeovil
	Scotland Perth
United States	Alabama Daleville Huntsville Madison
	Alaska Anchorage

Country	State/City (Site)
United States	Arizona Mesa Phoenix
	California Costa Mesa El Segundo Huntington Beach Long Beach Mountain View Palmdale Pleasanton Rancho Cucamonga San Diego San Jose San Luis Obispo San Mateo Santa Susana Santee Seal Beach Sunnyvale Sylmar Taft Torrance Van Nuys Ventura Victorville
Colorado	Aurora Centennial
Colorado	Colorado Springs Englewood
Connecticut	East Windsor
Florida	Cape Canaveral Davie Fort Walton Beach Ft. Lauderdale Jacksonville Kennedy Space Center Miami

Country	State/City (Site)
United States	Florida Orlando Shalimar Tampa Titusville
Georgia	Atlanta College Park Peachtree Warner Robins
Hawaii	Honolulu Kamuela Waimea Kihei
Illinois	Chicago Fairview Heights Mascoutah Rolling Meadows St. Charles Swansea
Indiana	Crown Point Gary
Kansas	Kansas City Wichita
Louisiana	Bossier City Lafayette
Maryland	Aberdeen Proving Ground Annapolis Junction California Germantown Patuxent River
Massachusetts	Lexington
Michigan	Waterford

**Site Listing Endnotes for Corporate
GHG Inventory Chart (cont.)**

Country	State/City (Site)
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United States	Minnesota Eagan
Mississippi	Starkville
Missouri	Berkeley Bridgeport Earth City Florissant Fort Leonard Wood Hazelwood Maryland Heights Portage Des Sioux St. Charles St. Louis
Montana	Glasgow Helena
Nevada	Las Vegas
New Jersey	Berkeley Heights Parsippany
New Mexico	Albuquerque
New York	New York
North Carolina	Fayetteville Havelock Kings Mountain Morrisville
Ohio	Brookpark Cincinnati Fairborn Heath

Country State/City (Site)

United States	Oklahoma Oklahoma City
Oregon	Arlington Boardman Gresham Hood River Portland The Dalles Wilsonville
Pennsylvania	Eddystone Langhorne Lemont Furnace Pittsburgh Ridley Park Smithfield
South Carolina	Ladson North Charleston
Tennessee	Cordova Memphis
Texas	Austin Dallas Dyess AFB El Paso Houston Irving Richardson San Antonio Universal City
Utah	Hill AFB Layton Salt Lake City West Jordan
Virginia	Arlington Chantilly

Country State/City (Site)

United States	Virginia Fairfax Herndon Leesburg Newington Newport News Virginia Beach
Washington	Auburn Bellevue Bingen Bothell Enumclaw Everett Issaquah Kent Moses Lake Mukilteo Olympia Puyallup Quincy Renton SeaTac Seattle Tukwila Vancouver White Salmon

Visit boeing.com/investors to view our **Annual Report** and to find additional information about our financial performance and Boeing business practices.

Visit boeing.com/community to view our **community investment information** and other information about how Boeing is working to improve communities worldwide.

Visit boeing.com/environment to view our **current Environment Report** and information on how the people of Boeing are developing ways to promote a more sustainable future.



A 787-9 Dreamliner is painted in a special blue livery that represents the Sustainable Development Goals adopted by the United Nations in September 2015. The United Nations General Assembly unanimously approved the 17 “Transforming our world: The 2030 Agenda for Sustainable Development” targets to be achieved over the next 12 years.

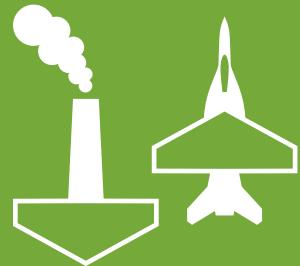


The Boeing Company
100 North Riverside Plaza
Chicago, IL 60606-1596
USA

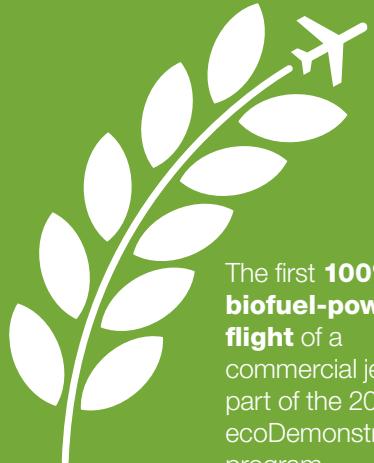
In 2016, Boeing and its suppliers **saved an estimated \$23 million** by collecting and sending 15 million pounds of titanium scrap to mills to be melted and recycled into usable forms, such as ingot, plate and sheet.



The 737 MAX uses **20 percent less fuel** compared with the original Next Generation 737 and is as efficient as a hybrid electric car.



Since 2007, we reduced greenhouse gas emissions by **29 percent** while growing our business and increasing product deliveries by 71 percent.



The first **100% biofuel-powered flight** of a commercial jet was part of the 2018 ecoDemonstrator program.



Boeing's Santa Susana Field Laboratory site in Simi Valley, Calif., is secured as **permanent open space habitat** safe for visitors, wildlife and neighboring community right next door to Los Angeles.



Our 2025 target to reduce energy use by 10% will help **cut greenhouse gas emissions** by 25%.

Two Boeing sites use **100% renewable electricity**:

Renton, Washington, home of the 737, and Boeing South Carolina, which uses 16,000 solar panels on the roof of its final assembly building.



The Wildlife Habitat Council has certified Boeing's efforts to support **sustainable ecosystems** at five sites.

Renton, Washington office employees **reduced energy use by 318,870 kWh** — enough to power 350 average U.S. homes for a month — during a single 90-day period in 2016.



Travel Smart! United Kingdom employees **reduced business travel mileage** by more than 25% from 2016 to 2017 by expanding use of video and virtual meetings, ride sharing and public and alternative transportation.



47 Boeing sites in six countries around the world representing 93% of Boeing's energy use competed in the 2018 Battle of the Buildings energy reduction competition.

The Everett Interiors Responsibility Center, which manufactures aircraft interiors, is constructing a new water recycling system that will save up to **22 million gallons of water** annually.



Boeing received the E.P.A. ENERGY STAR **Partner of the Year** award in 2018 for the eighth consecutive year.

More than **50 Boeing sites globally** are certified to the high standards of ISO 14001 environmental management system.

