



GLOBAL ENVIRONMENT REPORT 2020

COMPANION SUMMARY



**BOEING'S APPROACH
TO ENVIRONMENTAL
SUSTAINABILITY**

Climate change is one of the fundamental global challenges of our time. At Boeing, we are reducing carbon emissions and driving efficiency in everything we do to help protect our climate and enable air travel without harm to the environment.

Flying can be as energy efficient as other transportation modes and is often the only practical option for travelers, with 80% of aviation emissions coming from flights where no practical transportation alternative exists. The global aviation industry produces around 2% of all human-induced carbon dioxide emissions. Boeing will continue to lead in reducing emissions by developing ever-more efficient airplanes, investing in the development and use of sustainable fuels, and working with our customers to improve the global fleet's operational efficiency.

We are dedicated to reducing emissions not only via our products and services but also in our operations. We bring our spirit of innovation to our manufacturing sites throughout the world. In addition to our goal to reduce emissions of greenhouse gases,

we have absolute targets to reduce waste, water use, and energy use.

This document contains key information about Boeing's efforts in environmental sustainability, and the content aligns with the core elements of the Task Force for Climate-related Financial Disclosure (TCFD) recommendations. The CDP (formerly called the Carbon Disclosure Project), the industry standard for environmental reporting, recognized Boeing with a B rating in 2019 for our CO₂ emissions reduction and transparent reporting.

We will continue to work towards our environmental aspirations to reduce our environmental footprint and help give all of our stakeholders what they deserve: clean air, water and land. Our 2019 environmental sustainability achievements are based on commitments to the following:

Products	Operations	Collaboration	Governance
Providing innovative products and services to improve environmental performance.	Sustainable operations to improve the environmental performance of our factories, work sites and supply chain.	Collaborating with partners globally to advance innovative environmental solutions.	Comprehensive review and assessment of the most significant environmental challenges and risks.

PRIORITIES

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.



Stakeholder Environmental Priorities

- CO₂ emissions from 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

STRATEGY

Boeing launched its Global 2025 Strategy for Environmental Leadership in 2018. In 2019, we made progress by advancing several environmental initiatives. The strategy is guided by three overarching pillars: product innovation, sustainable operations and global collaboration.



Global 2025 Strategy for Environmental Leadership

Innovate for Performance



- Reduce product lifecycle footprint
- Accelerate technology and biofuels
- Proactively manage chemical restrictions

Excellence in Sustainability



- Reduce operations and supply chain footprint
- Sustain environmental compliance and excellence
- Remediate and restore at-risk sites

Inspire Global Collaboration



- Advance global sectoral standards
- Capitalize on focused investments
- Advocate for environmental leadership

Boeing has a strong track record of designing, building and operating products that are environmentally progressive.

Innovate for Performance

Engineering and designing top-performing products reduces aviation's carbon footprint.

- Each new generation of Boeing airplanes are 15% to 25% more efficient than the airplanes they replace.
- We are working to achieve carbon-neutral growth starting in 2020 and a 50% reduction by 2050.
- Our 787 Dreamliners have saved 48 billion pounds of fuel, compared to the airplanes they replaced—vastly reducing the amount of carbon our products emit.
- The 777X will achieve 10% lower fuel use, emissions, and operating costs than the competition.

Excellence in Sustainability

Innovation also improves the environmental performance of our operations.

- We have achieved an absolute reduction of 29% in greenhouse gas emissions from manufacturing since 2007.
- Two of Boeing's largest factories (737 plant in Renton, WA and 787 plant in Charleston, SC) are powered with 100% renewable energy
- Boeing made progress in 2019 by reducing solid waste by 15% and water use by 7% from the 2017 levels. Boeing is leading with recycling and procuring renewable energy programs.

- Boeing is using lasers to remove paint from aircraft, which improves quality and accuracy while reducing hazardous waste by over 90% compared to other paint removal methods such as sanding or chemical processes.
- Boeing is the only aerospace company able to recycle up to 100% of its carbon fiber waste, with 11 Boeing manufacturing sites diverting up to 1 million pounds of solid waste from landfill.

Inspire Global Collaboration

We work with partners around the world to advance inventive solutions for local and global environmental needs.

- Boeing awarded 31 unique grants to support community-based environmental programs in 2019.
- Boeing is the 2019 recipient of the National Association of Manufacturers Sustainability Leadership Award for finding an innovative way to recycle up to a million pounds (453,000 kilograms) of carbon fiber per year, working in partnership with UK-based ELG.
- Boeing is a founding member of the Sustainable Aviation Fuel Users Group, the International Aerospace Environmental Group, and the Aircraft Fleet Recycling Association.
- Boeing offers airline customers new airplanes that can be flown using sustainable fuel, an option that reduces CO₂ emissions by up to 80%.

METRICS AND TARGETS

Boeing is on track to meet the aviation industry’s emissions reduction goals. In 2019, all airlines worldwide flying international routes began formal monitoring and reporting of their emissions as part of the historic Carbon Offsetting and Reduction Scheme for International Aviation (CORSA), adopted by the United Nations’ International Civil Aviation Organization (ICAO) in 2016.

Commercial Aviation Carbon Reduction Goals	
Goal	Progress Details
<p>2010 1.5% per year fuel efficiency Working toward carbon-neutral growth</p>	<p>Working toward carbon-neutral growth, commercial aviation exceeded this goal, with an average 2.1% improvement per year. Boeing’s highly efficient airplanes, including the 787 Dreamliner family that reduces fuel use by 20% to 25% compared to the models it replaces, helped enable this success. Airline operational efficiency also contributed significantly through greater seating utilization, fuel conservation programs and other efforts.</p>
<p>2020 Carbon-neutral growth Implementation of global sectoral approach</p>	<p>Since January 2019, all airlines flying international routes began formal monitoring and reporting of their emissions as part of the historic Carbon Offsetting and Reduction Scheme for International Aviation. The United Nations’ International Civil Aviation Organization adopted CORSIA in 2016. With the program in place, the industry expects to offset 76% of the growth in global aviation CO₂ emissions from 2020 onward, based on pre-COVID-19 flying trends. Boeing supports the program, including tools and services from Boeing Global Services to help our customers with their CORSIA reporting needs.</p>
<p>2050 Reduce carbon emissions by 50% Half the net aviation CO₂ of 2005</p>	<p>Achieving this long-term goal requires continued research and development in all areas of an airplane and its operation: from sustainable aviation fuel to innovative new airframes, engines and materials technology for airplanes of the future — including hybrid and electric-powered airplanes — to researching new pathways and scaling up sustainable aviation fuel production. Boeing continues making technology and innovation investments and collaborating across the globe in all of these areas to reduce lifecycle emissions from the global fleet and achieve the goal.</p>

METRICS AND TARGETS

Conserving Resources at Factories and Worksites

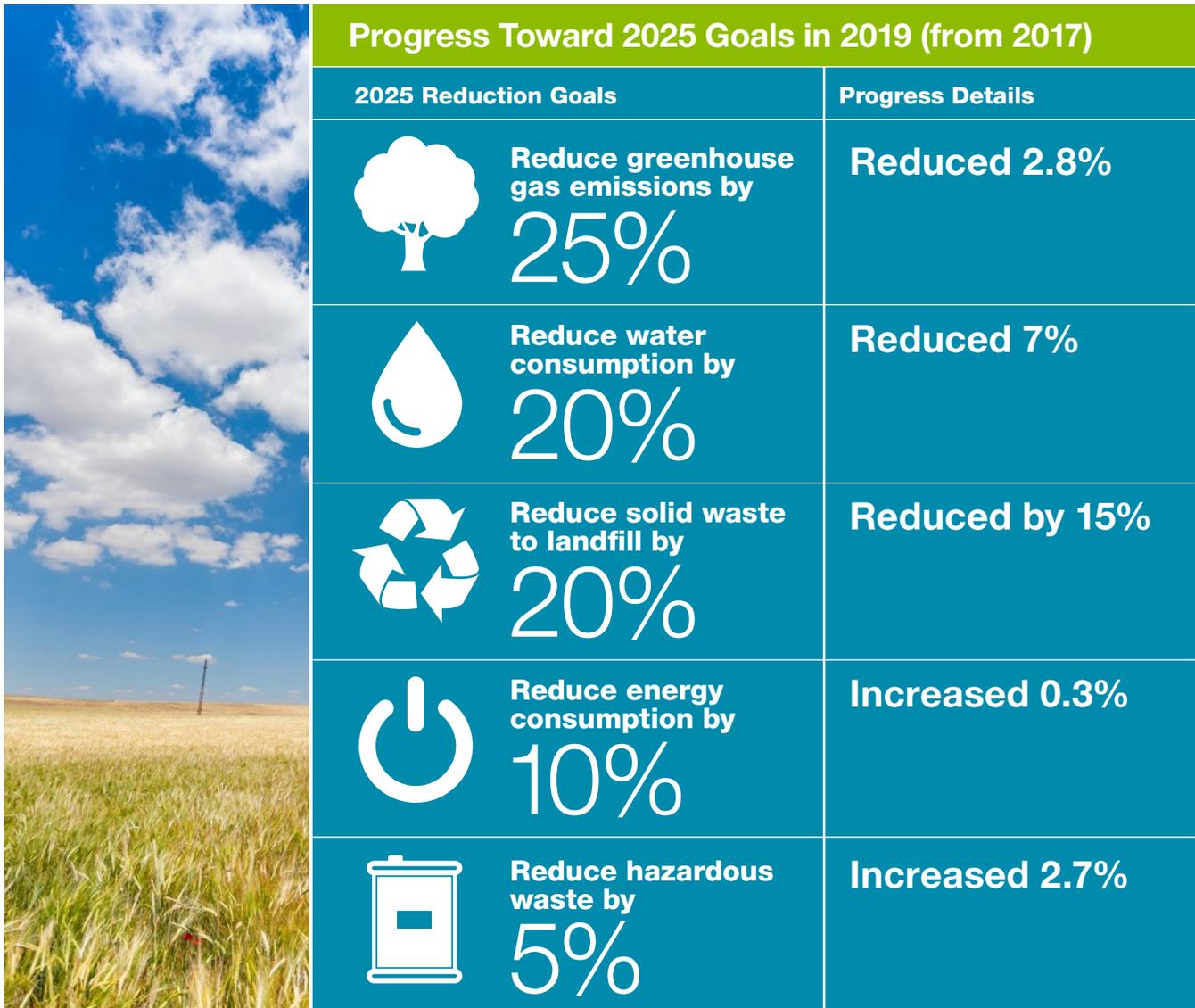
Boeing is making steady progress toward reaching its goals to reduce greenhouse gas emissions, energy use, water use, hazardous waste, and solid waste to landfill at its factories and worksites.

The bright spots include reducing solid waste by 15% in 2019, and water use by nearly 7% from the 2017 baseline. The 2025 target is reducing both by 20% over the baseline year of 2017.

Greenhouse gas emissions were down 2.8% last year, with a slight increase, 0.3%, in overall energy use. The 2025 targets are a 25%

and 10% reduction, respectively. Hazardous waste reduction remains a significant challenge, with a 2.7% increase in 2019 over the 2017 baseline. The target is a 5% reduction over the baseline year of 2017.

Innovative recycling, such as turning excess composite material into consumer products, is expected to help further reduce solid waste in coming years. Renewable resources are increasingly displacing fossil fuels as the source of energy powering Boeing operations.



METRICS AND TARGETS

Boeing is committed to reporting our greenhouse gas (GHG) emissions.

CDP’s climate framework is the industry standard for environmental reporting. In 2019, CDP recognized Boeing with a B rating for our CO₂ emissions reduction and transparent reporting. The GHG emissions reported to CDP represent 1,827 buildings in 44 countries where Boeing has operational control. These locations represent over 90% of Boeing operations, based on headcount. We report both location-based (reflecting the average emissions intensity of the grid) and market-based (reflecting the emissions intensity of the company’s electricity purchases) Scope 2 emissions. Scope 3 includes emissions from business travel only. Calendar year 2019 emissions are shown below in

tons and metric tons of carbon dioxide equivalents (CO₂e).

In addition to the emissions we report to CDP, we track a subset of emissions from natural gas combustion and purchased electricity associated with sites that represent the vast majority of Boeing’s operations and are identified by the city in which the Boeing operation resides (the Core Metrics Sites). Our 2025 targets are set and assessed based on performance at these sites, to keep a consistent basis for measurement over time. As with the CDP data, we show both location-based and market-based information.

CDP Report GHG	Description	Tons	Metric Tons
Scope 1	On-site direct emissions	676,000	613,000
Scope 2	Emissions from purchased electricity		
<i>Location-based</i>	– Based on regional factors for carbon content	960,000	871,000
<i>Market-based</i>	– Based on carbon content of actual purchased energy	808,000	733,000
Scope 3	Emissions from business travel	320,000	290,000

Core Metrics Sites GHG*	Description	Tons	Metric Tons
Location-based	Based on regional factors for carbon content	1,218,000	1,105,000
Market-based	Based on carbon content of actual purchased energy	1,075,000	976,000

*Natural Gas and Electricity



GOVERNANCE AND RISK MANAGEMENT

Boeing's governance includes reviewing and assessing significant environmental challenges and risks to the company and industry, such as climate and policy change.

The company's environmental strategy and policies are guided by the Environment, Health and Safety (EHS) Policy Council, composed of Boeing's Executive Council and led by the president and chief executive officer. Environmental matters are part of the value proposition of our airplanes.

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

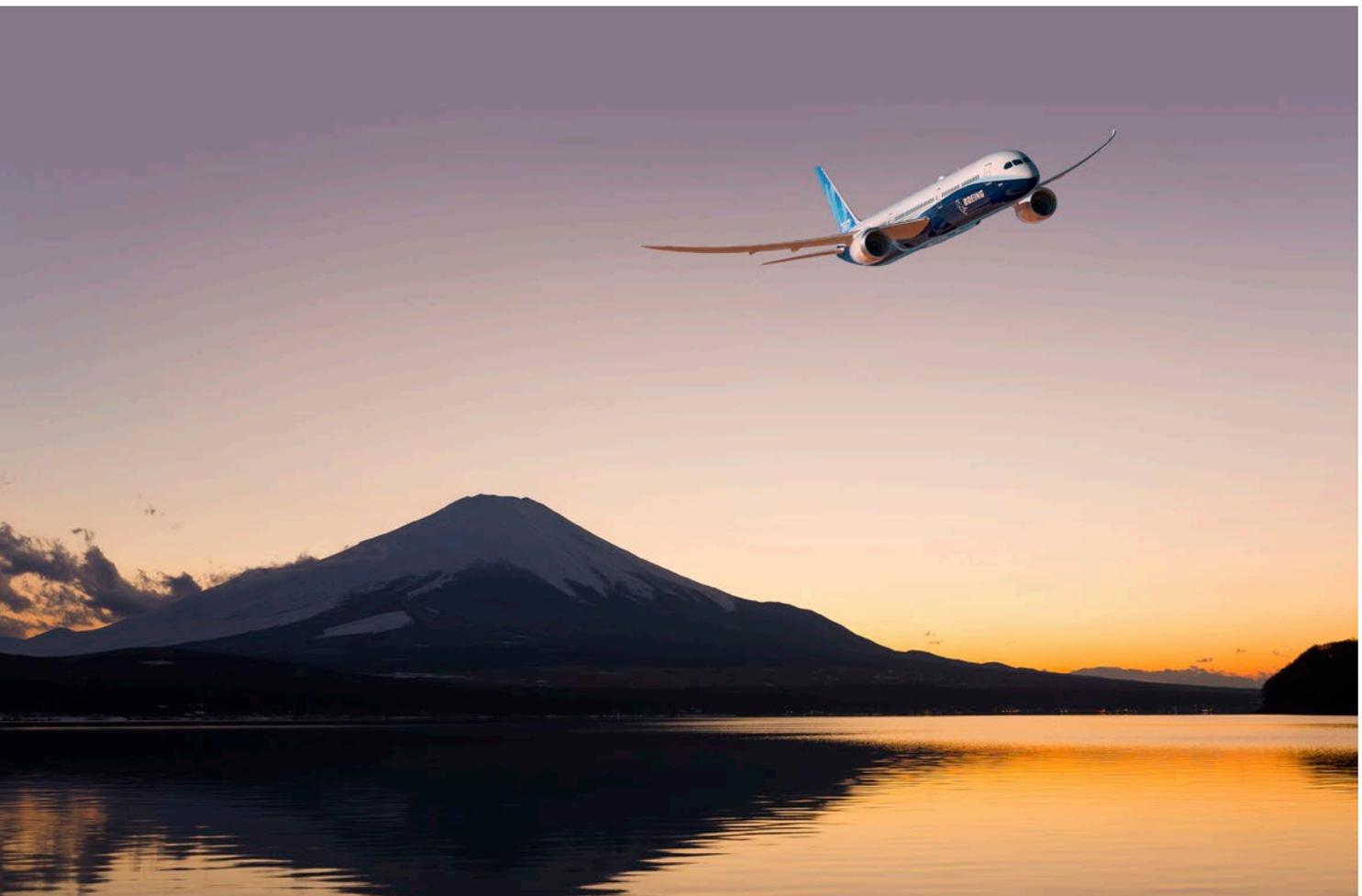
Reviews by the EHS Policy Council and a functional review with the president and chief executive officer are conducted twice a year. Progress and status are reported through each of these venues in addition to other internal executive reviews across the company. In addition, The Board of Directors reviews top-level, strategic operational and compliance risks, which include environment-related risks.

One EHS 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.

Boeing named Chris Raymond its first Chief Sustainability Officer, effective Oct. 1.



THE BOEING FAMILY OF REPORTS

Visit [boeing.com/environment](https://www.boeing.com/environment) to view the full Environment Report as well as more information on how the people of Boeing are developing ways to promote a more sustainable future.

Visit [boeing.com/investors](https://www.boeing.com/investors) to view our Annual Report and to find additional information about our financial performance and Boeing business practices.

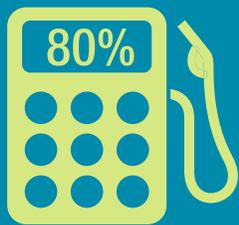
Visit [boeing.com/community](https://www.boeing.com/community) to view our community investment information and other information about how Boeing is working to improve communities worldwide.

Visit [boeing.com/ethics-and-compliance.page](https://www.boeing.com/ethics-and-compliance.page) to view our Ethical Business Conduct Guidelines, a resource to help managers and employees discuss and practice ethical decision-making skills.

Boeing is committed to making positive Environmental, Social and Governance (ESG) contributions. To learn more about Boeing's commitments in each area, visit [boeing.com/principles/esg](https://www.boeing.com/principles/esg).



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Boeing offers airline customers new airplanes with sustainable fuel, **an option that reduces CO₂ emissions by up to 80%.**



Carbon-fiber recycling at 11 Boeing work sites will **reduce more than 1 million pounds of solid waste to landfill.**



Over 230,000 commercial sustainable fuel flights to date, a number that grows every day.



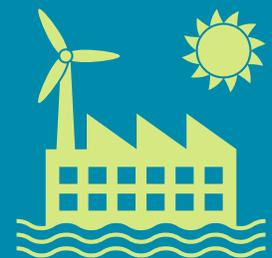
ecoDemonstrator program-tested vortex generator could save an airline, flying 100 jets, up to 3 million gallons of fuel a year — **enough to take about 3,800 cars off the road during that time.**



Sustainable packaging avoided **900+ tons of waste in 2019.**



Boeing earned the **ENERGY STAR Partner of the Year Award, for the 10th consecutive year.**



100% renewable energy — solar, wind or hydropower — runs Boeing's factories in Renton, Wash. and Charleston, S.C., and a large data center in Arizona.



Boeing received a **2020 Sustainability Leadership Award from the National Association of Manufacturers** for the innovative efforts to recycle aerospace carbon fiber.