

Sustainability in Aerospace

People, Products, Operations, Communities

Fleet Renewal	Operational Efficiency	Renewable Energy	Advanced Technology
 	 	 	  

Sustainability in Aerospace Manufacturing

People, Products, Operations, Communities

Embedding Sustainability at Boeing

We have organized our sustainability efforts around four key pillars: People, Products & Services, Operations and Communities.

 Employee Safety and Well-Being	 Environmentally Responsible Operations
 Global Aerospace Safety	 Community Engagement
 Global Equity, Diversity and Inclusion	 Innovation and Clean Technology



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








Boeing recycles its aerospace-grade excess carbon fiber and diverts about 1 million pounds of solid waste to landfill annually.



Each year, we have our employees sign a Code of Conduct and participate in Boeing's Ethics Recommendation.

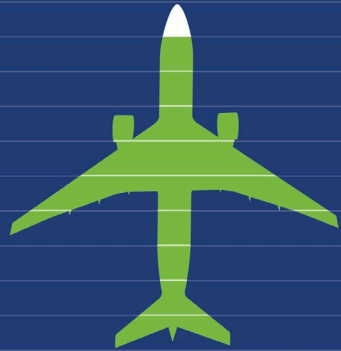


In 2019, Boeing established a permanent Aerospace Safety Committee to oversee and ensure safe products and services.

Performance Area ¹	2025 Goals Versus 2017	2021 Progress Toward 2025 Goals ³	2030 Goals
 Greenhouse Gas Emissions	Reduce emissions by 25% ²	25% reduction Greenhouse gas emissions were 10% under plan primarily due to reduced production activities and procurement of renewables.	<ul style="list-style-type: none"> • Net-zero emissions⁴ • 55% GHG reduction from 2017 • 100% renewable electricity
 Energy	Reduce energy ⁵ consumption by 10%	12.2% reduction Despite cold northwestern U.S. weather in December, energy continued to be under plan overall for the enterprise, ending the 2021 reporting year at 9.8% under plan. Remote working conditions; reduced production activities; and conservation gains contributed.	<ul style="list-style-type: none"> • 10% energy-intensity reduction from 2025
 Water	Reduce water withdrawal by 20%	26.4% reduction Water consumption was 18.9% under plan in 2021, primarily due to remote working conditions and reduced production.	<ul style="list-style-type: none"> • 5% reduction from 2025
 Solid Waste	Reduce solid waste to landfill by 20%	53% reduction Solid waste was steady at 44% under plan in 2021. Reduced production rates and work-from-home operations throughout 2021 drove this metric.	<ul style="list-style-type: none"> • 30% reduction in waste produced from 2025 • Over 90% diversion from landfill or incineration • Zero solid waste where applicable at major sites
 Hazardous Waste	Reduce hazardous waste by 5%	28% reduction Hazardous waste was 16% under plan in 2021. Key events, including improvements in treatments lines, were positive. Dealing with unused expired materials is an issue.	<ul style="list-style-type: none"> • 5% hazardous waste reduction from 2025

Sustainability in Aerospace Manufacturing

Focus on recycling



90%

Nearly all of a Boeing commercial airplane is recyclable by weight for parts reuse and scrap.

Diverting waste from landfills

These Boeing sites participate in the carbon composite material recycling effort:



Boeing EnCore Interiors layup technicians Alberto Nieto Garcia (left) and Bang Nguyen laying out a silicone bag as part of the 737 floor panel fabrication process. The new reusable bagging system is expected to save an estimated \$175,000 annually in material costs. (David Brink photo)

Creating a new supply chain



From carbon fiber to car parts.

- **Boeing extensively studied** how to reduce waste from its carbon composite manufacturing. We took action as 777X wing production ramped up and excess composite material was forecast to grow to 7% of solid waste to landfill.
- **Processes to minimize waste** were pioneered at the Composite Wing Center (CWC) in Everett, WA. Boeing also launched a pilot project to provide excess material from the CWC to a UK recycler.
- **ELG Carbon Fibre stood out** in the industry for its unique ability to recycle cured and uncured material. Working together, Boeing and ELG created a new supply chain that provides recycled carbon fiber to other manufacturers.
- **Boeing and ELG formed a partnership** in late 2018 based on the pilot project's success.
- **About 1 million pounds of excess** a year goes to ELG instead of landfills. That represents the majority of Boeing's excess composite material. It comes from all 10 manufacturing sites in the United States, plus Canada and Australia.