



» Jim McNerney  
Chairman, President and  
Chief Executive Officer

Mary Armstrong  
Vice President of Environment,  
Health and Safety

### **Environmental Affiliations**

Boeing participates in  
focused, progressive and  
action-oriented programs

CEO Message

| Pioneering Technologies

| Stewardship

| Operational Performance

| Community Investment



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## Message from Mary Armstrong



In May 2007, Boeing expanded the role of its environmental team by creating the corporate Environment, Health and Safety organization. Our mandate is clear—to provide strategic direction and oversight, and to further embed environmental performance into Boeing's thinking, culture and action.

As a foundation, in 2008 we included, for the first time, challenging five-year environmental performance targets in the standard business plans of our operating units. At Boeing we know that to truly improve, you must first measure accurately, then set targets and finally, hold yourself accountable to beat them.

Boeing is an innovation leader, and our most critical contribution to protecting our eco-systems is—and will continue to be—bringing new technologies to market that improve the environmental performance of our air, land, space and network products as well as our support services and operations.

We also have a responsibility to be good stewards of our environment and good neighbors. We are committed to continuously reducing the environmental impact of our operations and to ensuring timely cleanup of sites that have been affected by prior practices that have created pollution.

This 2008 Environment Report details the environmental impact of our operations, the targets for improvement to which we have committed, and the strategy and actions that we will use to achieve them. The report seeks to address major environmental items in both quantitative and qualitative form and is, to the best of our ability, an accurate description of our performance. We have strived to clearly explain our methodology and reasoning.



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CEO Message



» Environmentally Progressive  
Products and Services

Air Transportation Systems

Alternative Energy Solutions

Research and Development

## Environmentally Progressive Products and Services

At Boeing, we have an ongoing legacy of integrating environmental performance improvements through technology advancements. Over the last 40 years, airplane CO<sub>2</sub> emissions have been reduced by around 70 percent and the noise footprint area has been reduced by approximately 90 percent. That legacy continues today with every airplane we design and build.

Boeing's newest airplanes, the 787 Dreamliner and the 747-8, exemplify the company's dedication to environmental design innovation. Incorporating four innovative technologies—new engines, increased use of lightweight composite materials, high-efficiency systems applications, and modern aerodynamics—the 787 is designed for the environment with an impressive 20 percent improvement in fuel use and an equivalent reduction in carbon dioxide emissions compared to today's

Boeing is driving environmentally progressive technologies into its products and services. Pictured here is a Next-Generation 737-900ER with Blended Winglets, wing tip extensions that lower fuel use, emissions and noise.

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emissions. For example, the Airplane Health Management (AHM) Performance Monitoring Module automates and enhances the process of fuel and carbon dioxide emissions performance monitoring by airline personnel. It applies advanced health management technology to identify conditions that may affect fuel performance and provides research tools and decision support information within the context of the overall airplane condition.

While the improvements we have made are significant, we believe we can do more. That's why we have committed to improving the fuel efficiency of each new generation of commercial airplanes by at least 15 percent.

### The Boeing 747-8 Intercontinental and 747-8 Freighter: Designed for Environmental Performance

On the new 747-8 family Boeing is leveraging the technologies from the 787 Dreamliner to further its commitment to creating environmentally preferred commercial jetliners.

#### Lower Fuel Use

Three key features—new engines, more efficient structure and advanced aerodynamics—contribute to a 16 percent improvement (on a per-seat basis) in fuel use for the 747-8 compared to the 747-400.

The new GEnx-2B67 engines incorporate the latest technologies—such as a composite fan case and blades and a revolutionary turbine—to create double-digit efficiency gains over the engines it replaces. The ultra-efficient structure of the 747-8 provides the lowest operating empty weight per seat of any large airplane. Lastly, the new-design wing incorporates the latest aerodynamic airfoils, raked tips and a simplified lightweight flap design, further improving the overall fuel efficiency of the 747-8.

#### Reduced Emissions

Carbon dioxide (CO<sub>2</sub>) is produced as a result of fuel consumption. This means that with reduced fuel use comes an equivalent reduction in carbon dioxide emissions. Another key emission standard for commercial jetliners is nitrogen oxides (NO<sub>x</sub>). Specific regulations have already been set for future airplanes based on the thrust ratings of an airplane's engines.







Environmentally Progressive  
Products and Services  
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## Alternative Energy Solutions

Alternative energy sources offer the potential to reduce greenhouse gas emissions. We are pioneering advancements in environmentally progressive energy sources in three key fields.

### Advanced-Generation Biofuels

To highlight the technical feasibility of using biofuels in a commercial jetliner, we conducted the first commercial aviation flight using a sustainable biofuel mixed with traditional kerosene-based fuel in February 2008 with Virgin Atlantic and GE Aviation. In addition to conducting engine ground testing with Pratt & Whitney, we will conduct joint biofuel demonstration flights in 2008 with Air New Zealand and Rolls-Royce and in 2009 with Continental Airlines and GE Aviation, with an initial emphasis on sustainable biofuels that could be applied to the existing airplane fleet to reduce carbon dioxide emissions.

Since first-generation biofuels may compete with food stocks, Boeing has always been focused on sustainably grown, advanced-generation biofuels. The following chart on this page highlights the relative energy density of various types of biofuels.

Future fuels must be sustainable and not compete with food crops. Boeing seeks to leverage research like that of the Hawaii Agriculture Research Center on *Jatropha curcas*, 2EY-BDC 00017EMC solar cells, powering everything biofuels.

### Solar Cells

Our wholly-owned subsidiary Spectrolab is one of the world's leading manufacturers of solar cells, powering everything from satellites and interplanetary missions to renewable solar energy companies in California, Arizona, and Australia. Spectrolab's Earth-based concentrator cells currently hold the world's record with 40.7 percent efficiency in converting sunlight to electricity—and the company is pioneering new technologies anticipated to yield further improvements.



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### Fuel Cells

Fuel cells directly convert hydrogen into heat and electricity without combustion, reducing the need for conventional fuels, eliminating emissions (except for heat and water), and lowering noise. Fuel-cell technology holds promise in providing cleaner, quieter operation of secondary airplane power systems. Led by Madrid-based Boeing Research & Technology Europe, we recently conducted experimental flight tests of a Boeing Proton Exchange Membrane (PEM) fuel cell/lithium-ion battery system in February and March 2008 in Ocaña, Spain, celebrating the first flight of a manned airplane powered by hydrogen fuel cells in aviation history. We continue to study additional fuel cell technologies, including a Solid Oxide fuel cell.

### Boeing, Virgin Atlantic and GE Aviation Flew First Commercial Jet on Biofuel

Boeing, Virgin Atlantic and GE Aviation conducted the first commercial aviation flight using a sustainable biofuel mixed with traditional kerosene-based jet fuel on February 24, 2008. The biofuel flight demonstration highlighted the technical feasibility of using biofuels in a commercial jetliner and was a significant step toward a long-term vision of fully sustainable, low-carbon-lifecycle fuel solutions for the aviation industry.

The Virgin Atlantic 747-400 flew using a biofuel blend composed of babassu



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### Spectrolab to Provide Renewable Energy to Australia

The Boeing Company announced on April 14, 2008, a third multimillion-dollar contract award with Solar Systems Pty. Ltd. for concentrator photovoltaic cell assemblies used to produce renewable energy. The cells will be used in the new 154-megawatt solar power station to be built in the state of Victoria, Australia, in addition to other power stations located throughout Australia and the United States. Contract details were not disclosed.

Under the terms of the new contract, Spectrolab Inc. of Sylmar, Calif., a wholly owned Boeing subsidiary, will provide solar cell assemblies capable of generating more than 350 megawatts of electricity. When combined with previous contracts awarded in April and August 2006, the Hawthorn, Victoria-based Solar Systems has ordered approximately 360 megawatts of renewable power from Spectrolab.

"Solar energy is in high demand, and our record-breaking conversion efficiency of over 40 percent is an industry best," said David Lillington, president of Spectrolab. "Our partnership with Solar Systems has resulted in the demonstration of affordable and reliable concentrating solar power systems. Renewable energy is a worldwide priority, and Spectrolab is well positioned to expand its global role in this rapidly expanding industry."

Spectrolab is one of the world's leading suppliers of photovoltaic solar cells, solar panels, searchlight and solar simulators and is currently celebrating 50 years of supplying solar array panels to the space industry.

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## Research and Development

Much of our airplane development work—be it weight reduction or advanced aerodynamics—is focused on fuel efficiency. In fact, more than 75 percent of Boeing Commercial Airplanes' research and development (R&D) effectively contributes to improving the environmental performance of our products. Fuel efficiency continues to be a core focus of our R&D efforts—lowering fuel use lowers CO<sub>2</sub> emissions. We are also striving to make our airplanes quieter in the community as well as inside the cabin. And we continue to explore far-reaching projects such as low-carbon alternative fuels for aviation use.

We have also developed alternative materials and processes for manufacturing and maintenance.



A Boeing lab technician conducts automated freeze-point testing on jet fuel samples at the Boeing Commercial Airplanes Fuels and Lubricants Test Laboratory in Seattle, Wash. Boeing is exploring second-generation biofuel testing to identify renewable alternative fuel sources for aviation uses.

Our Environmental and  
Climate Change Policies  
Environment, Health and  
Safety Organization  
Commitment to Remediation  
Performance Targets  
Environmental Management

### Aggressive Performance Targets

**15%**

improvement in fuel efficiency and CO<sub>2</sub> emissions for each new generation of commercial airplane

**25%**

improvement at our major manufacturing facilities over five years in: energy efficiency, greenhouse gas emissions intensity, hazardous waste per dollar of revenue, and recycling rates

**100%**

of major Boeing manufacturing facilities will achieve certification to the ISO 14001 environmental management system standard by the end of 2008.

## Environmental Stewardship



Being good environmental stewards means more than developing plans and stating objectives. It means working every day to find ways to lessen the environmental impact of our products, services and operations. We are driving environmental thought and action throughout our company by establishing aggressive operations and product performance targets, forming a corporate organization to lead our enterprise-wide environmental strategy, adopting an environmental policy, strengthening our environmental management system and remediating locations affected by past business operations.





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Boeing continued to make significant progress on other remediation programs in 2007. Highlights included achieving major milestones in initiating groundwater cleanup at several projects in California and obtaining agency approval on the national soil and groundwater cleanup plans for the former Chemical Commodities Inc. Superfund site in Kansas. Steady progress was made at numerous other sites with the achievement of intermediate milestones that will ultimately lead to completion of investigation and cleanup activities at these sites.

## Performance Targets

Over the last 10 years, Boeing has reduced absolute energy use by 37 percent and hazardous waste by 52 percent.\*

Reductions in hazardous waste were driven by more efficient, Lean+ manufacturing methods, such as kitting chemicals to reduce excess waste and expired material; using more environmentally progressive materials, such as a low solvent top-coat painting to reduce the amount of solvent used in painting processes; and improving material management systems.

Our energy conservation efforts, driven by reduced demand for production requirements, investments in more efficient building systems and equipment at our sites, Lean+ methods to reduce consumption and waste, and employee awareness campaigns highlighting behavioral conservation opportunities, significantly reduced our energy consumption.

It's a good start, but we are committed to doing much more.

That's why we have established five-year targets to reduce energy use, greenhouse gas emissions intensity and hazardous waste and to increase recycling rates. By 2012 at our major manufacturing facilities, we are targeting 25 percent improvement goals for solid waste recycling rates, energy efficiency and greenhouse gas emissions intensity; and we have set a comparable goal for hazardous waste reduction, greenhouse gas and to waste 1 25 percent reduction hazardous waste and house and to





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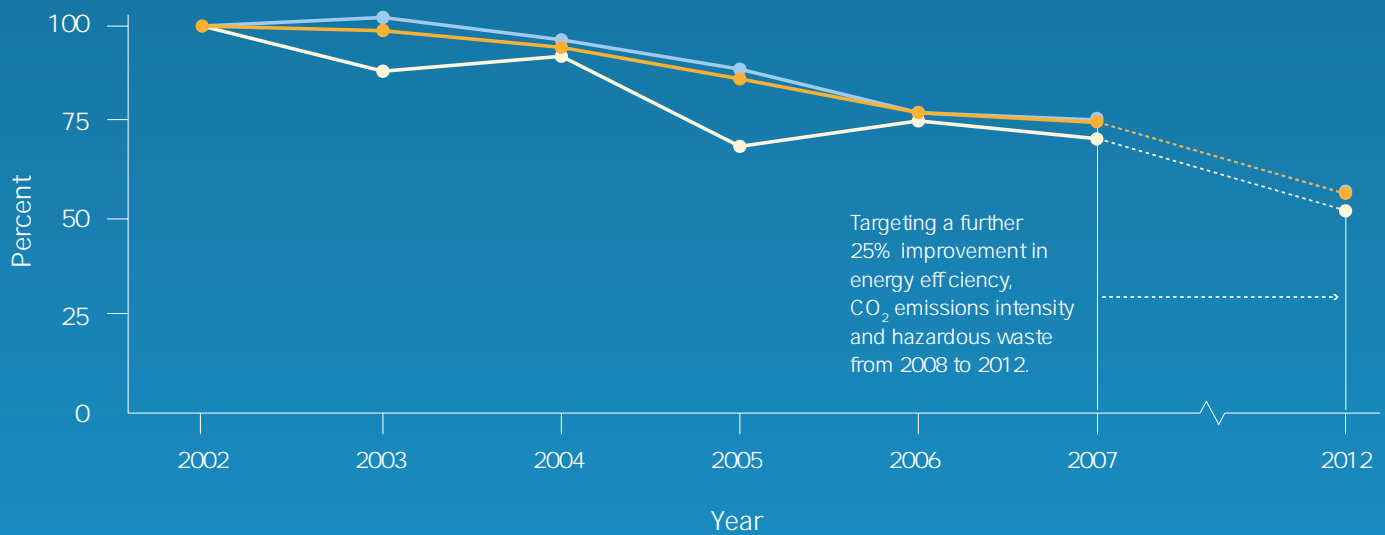




- Energy Conservation
- Carbon Dioxide Emissions
- Water Conservation
- Hazardous Waste and Recycling
- Toxic Release Inventory
- Environmental Awards

## Operational Performance

### Energy, Emissions and Waste – 2002 to 2007



**Progress achieved as of 2007**

- Energy Efficiency: -24.8%
- CO<sub>2</sub> Emissions Intensity: -24.4%
- Hazardous Waste -30.7%

Performance indicators normalized to revenue. Energy: MMBtu / \$mil. CO<sub>2</sub> Emissions: metric ton / \$mil. Hazardous Waste: ton / \$mil.





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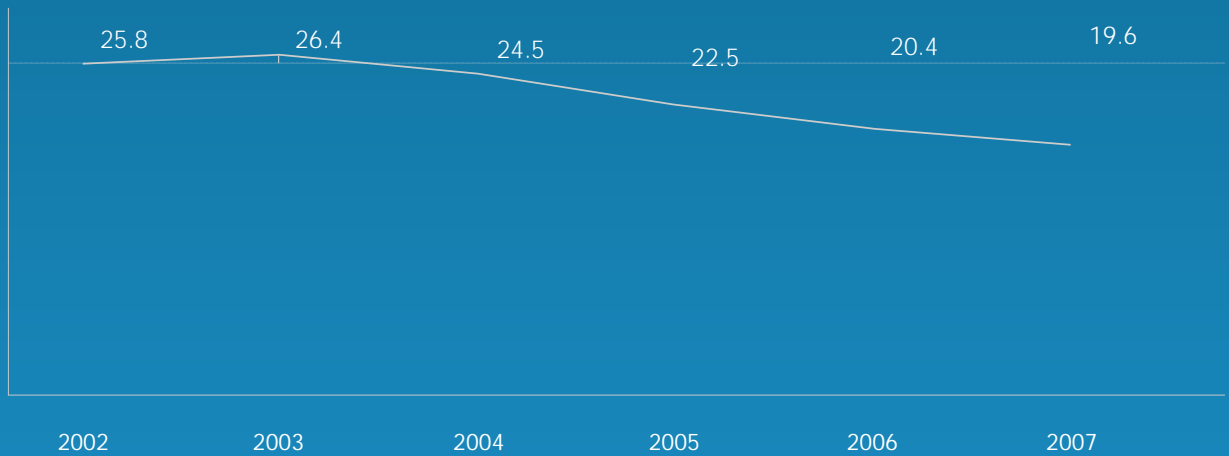
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### CO<sub>2</sub> Emissions Intensity at Major U.S. Sites







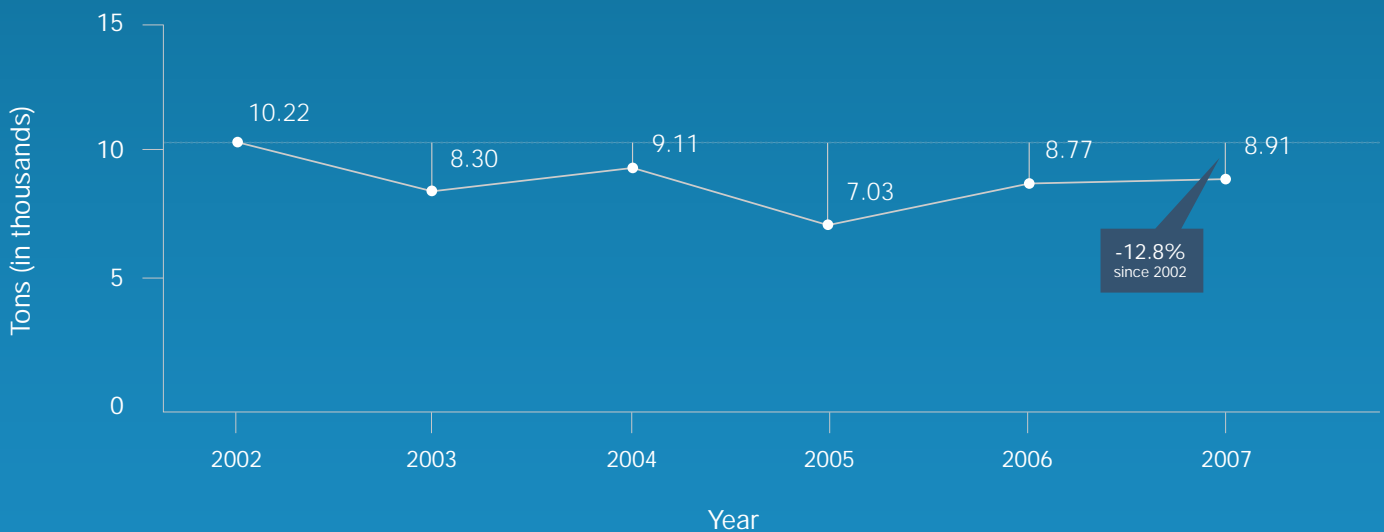
- Energy Conservation
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## Hazardous Waste and Recycling

Boeing is aggressively pursuing reductions in hazardous waste across the value stream, from better coordination with our partners to reduce unused chemicals to replacing hazardous materials with more environmentally progressive solutions. Since 2002, hazardous waste has been reduced by 30.7 percent on a revenue-adjusted basis. Last year, Boeing's Mesa facility began using a new, chrome-free paint primer on Apache helicopters in production to reduce chrome usage and manufacturing waste. And our paint hangars in Everett, Seattle and Renton, Wash., have replaced the conventional chromated conversion coat with a Boeing-invented sol-gel material to eliminate chromium. At our Everett paint hangar in 2007, the chemical substitution resulted in a reduction in rinse water usage by 160,000 gallons and eliminated chromated wastewater for this process.

We will boost our recycling rates from approximately 60 percent to 75 percent by 2012 through a number of different initiatives, including the maturing of office recycling programs to reduce cans, bottles and paper from landfills. Specific sites have already made significant improvements; for example, our fabrication facility in Portland, Ore., recycled 93 percent of all solid waste in 2007.

### Hazardous Waste at U.S. Sites



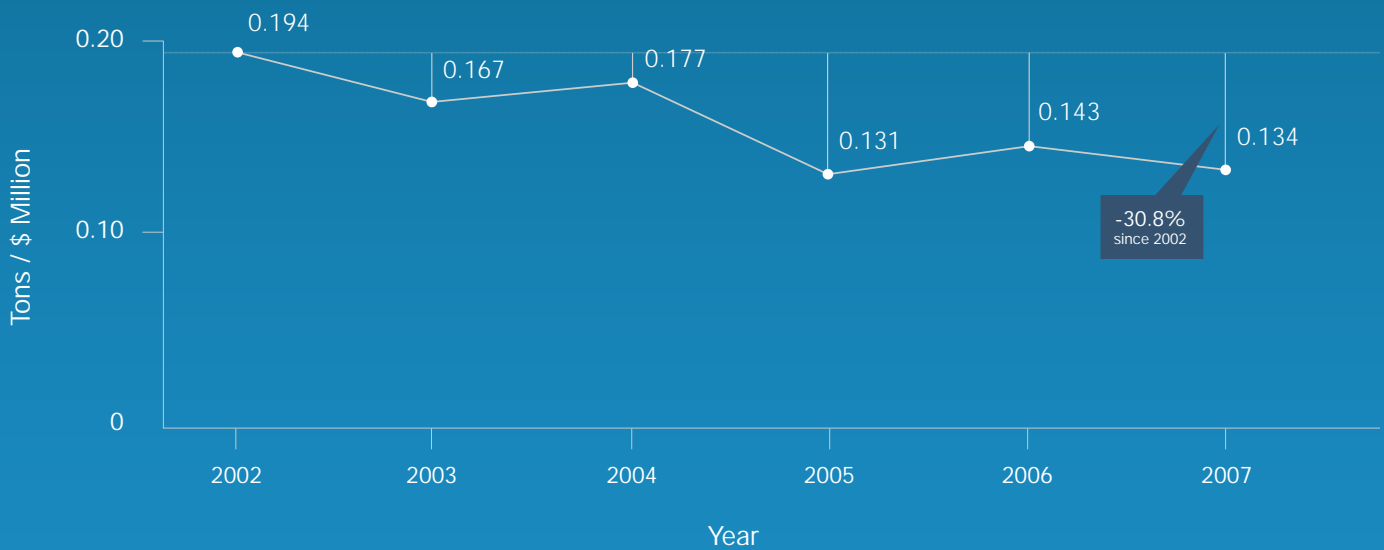
Footnotes:

- Reflects hazardous waste from U.S. operations only.
- Totals normalized for divestitures by excluding Wichita, now Spirit AeroSystems, from 2002 to 2005.
- Operational hazardous waste does not include remediation and construction activity.

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### Hazardous Waste Normalized to Enterprise Revenue



Footnotes:

- Reflects hazardous waste from U.S. operations only.
- Totals normalized for divestitures by excluding Wichita, now Spirit AeroSystems, from 2002 to 2005.
- Operational hazardous waste does not include remediation and construction activity.

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## Toxic Release Inventory

Boeing significantly reduced its Toxic Release Inventory releases through the reformulation of more environmentally progressive manufacturing materials and the application of Lean principles to minimize usage and waste.

However, transfers increased in 2006 due to production rate increases and a reduction in the amount of chemicals we treated on-site at some of our facilities (which resulted in offsite shipments for treatment).

### Toxic Release Inventory (TRI)\*

Releases**	2002	2003	2004	2005	2006
Releases (millions of lbs)	0.61	0.47	0.33	0.22	0.25
Percentage change		-23%	-46%	-64%	-59%
Normalized to revenue (lbs/million \$ revenue)	12	10	6	4	4
Percentage change from normalized		-18%	-45%	-65%	-65%
<b>Transfer***</b>					
Transfers (millions of lbs)	2.1	1.7	1.8	1.7	3.3
Percentage change		-19%	-14%	-19%	57%
Normalized to revenue (lbs/million \$ revenue)	40	34	35	32	54
Percentage change from normalized		-13%	-12%	-20%	35%
<b>Total</b>					
Total release and transfers (millions of lbs)	2.7	2.2	2.1	1.9	3.5
Percentage change		-19%	-22%	-30%	30%
Normalized to revenue (lbs/million \$ revenue)	51	45	41	35	57
Percentage change from normalized		-13%	-20%	-31%	11%
Revenue (billions)	52.7	49.3	51.4	53.6	61.5

\* Normalized for major divestitures, including the Wichita site.

\*\* Releases are direct to air, water and land.

\*\*\* Transfers are shipments off-site and to Public Owned Treatment Works (POTW).



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## U.S. Navy Honors Green Hornet Team Environmental Efforts

Boeing Environmental  
Philanthropy  
Boeing-Sponsored Employee  
Volunteerism

Boeing made cash contributions of nearly \$10 million over the last five years to support innovative environmental programs.

Boeing employees collectively donate thousands of hours of their own time to company-sponsored environmental volunteer events each year.

## Investing in Our Communities



Boeing, through its Global Corporate Citizenship function and together with individual employees, is actively involved in efforts to preserve the environment.



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## Cascade Land Conservancy

The Cascade Land Conservancy was awarded a \$750,000 grant from The



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