



Backgrounder

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Boeing 787 Dreamliner Being Designed for Environmental Performance

Boeing has made steady progress throughout the jet-age in improving the environmental performance of its products on factors ranging from fuel use and emissions to community noise. With the 787 Dreamliner, Boeing is again introducing new technologies to create better environmental performance for commercial jetliners.

The company's commitment to improving the environmental performance of its products is based on a deeply held belief that doing the right thing for the environment is good business. This is especially true for a manufacturer of airplanes because one of the many reasons that people choose to fly is to enjoy the rich variety of environmental wonders around the world.

Fuel Use Reduced

Four key technologies contribute to an impressive 20 percent improvement in fuel use for the 787 Dreamliner as compared to today's similarly sized airplane. New engines, increased use of light weight composite materials, more-efficient systems applications and modern aerodynamics each contribute to the 787's overall performance.

Emissions Cut

Carbon dioxide (CO₂) 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_x). Specific regulations have already been set for future airplanes, using a complex formula that is based on the thrust ratings of an airplane's engines. The 787 is being designed

to ensure it will be significantly better than today's requirements – more than 30 percent better than today's 767s – and it will be better than the future, more-stringent regulations being incorporated by the Committee on Aviation Environmental Protection (CAEP).

Quieter Takeoffs and Landings Delivered

As airport community neighbors know, reducing the noise created by airplanes during takeoffs and landings is an important measure of environmental performance. As with its record on continuously reducing fuel use and thus reducing emissions, Boeing has worked to reduce the sound footprint – the distance across which disturbing noise is heard.

The 787 Dreamliner uses a number of new technologies – most importantly, acoustically treated engine inlets and chevrons, the distinctive serrated edges at the back of the engine, and other special treatments for the engines and engine casings – to ensure that all sound of 85 decibels (about the level of loud traffic heard from the side of the road) never leaves the airport boundaries. In fact, the noise footprint of the 787 is more than 60 percent smaller than those of today's similarly sized airplanes.

Point-to-Point Travel Enabled

The mission capability of the 787 Dreamliner also provides an environmental advantage, allowing airlines to offer more direct flights connecting mid-sized cities. While today's larger wide body airplanes have the range to accomplish such missions, they are too large to operate economically on routes between mid-sized cities. The mid-sized 787, however, can operate quite efficiently between such cities, eliminating the need for additional takeoffs and landings.

Connecting people more directly to their destinations offers a number of environmental benefits. A more direct route uses less fuel, which means fewer emissions. Likewise, fewer takeoffs and landings reduce the total noise footprint. And, for those passengers who need to be at hub airports, removing pass-through traffic keeps airports and airways clearer. Studies show that between 30 and 50 percent of all passengers at large hub airports are just passing through, creating congestion and other environmental impacts in a city that is neither their point of origin or destination.

The 787 is designed to transport passengers and cargo from their city of origin to their final destinations in the most environmentally efficient manner

Manufacturing Technologies Mean Less Waste

Because the 787 is made primarily of carbon-fiber composite material, which is trimmed like cloth, manufacturing processes will produce less scrap material and waste. Today's airplanes are made primarily of aluminum, which must be milled and machined from large sheets or blocks to create airplane structure. In general, as much as 90 percent of the raw aluminum used to create airplane parts is turned into scrap during the manufacturing process. While this material can be recycled, it is better to avoid the waste whenever possible. The 787 composite solution addresses this efficiency.

In addition, the design team is working with requirements to reduce or eliminate materials that are less desirable for environmental performance and worker well being.

The result will be an overall manufacturing and maintenance process that produces less waste and uses fewer harmful chemicals and agents.

End-of-Life Recycling

Boeing is already working with companies around the world to ensure the processes required to allow the 787 to be recycled when it is eventually retired are in place. Though the first retirements are likely 30 to 40 years away, it is important that work be done today to prepare for this event.

A Life Cycle Approach

It is the combination of its historic commitment to improving the environmental performance of its airplanes and a specific life-cycle approach to designing its newest airplane that has allowed Boeing to create a super efficient commercial jet transport. The 787, in part because of its improved environmental performance, is the most successful launch of a new airplane in commercial aviation history. Airlines of the world are choosing the purchase the 787 because they share in Boeing's commitment to the environment. Likewise, beginning in 2008, passengers will be able to choose an airplane that offers more comfort and better environmental performance.

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