



Backgrounder

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Boeing and Sustainable Aviation Fuel Development

Boeing is committed to protecting the environment and supporting long-term sustainable growth for air transport. As part of this commitment, Boeing is an industry leader in efforts to develop and commercialize sustainable aviation fuel. This helps reduce aviation's reliance on petroleum fuel and supports our industry and customers to achieve environmental goals.

In 2008 and again in 2012, the industry committed itself to ambitious environmental targets to reduce CO₂ emissions: reducing emissions by 1.5 percent annually from 2008 to 2020, stopping the growth of emissions by 2020 and cutting them to half of what they were in 2005 by 2050. Sustainable aviation fuel is a pillar of the industry's strategy for meeting these targets¹.

Among transportation modes, aviation is unique for its dependency on liquid fuels for today and into the foreseeable future. Unlike ground transportation, electric or hybrid-electric power will not be available for short-range commercial aircraft until at least 2030 and even later for long-range models.

Biofuel produced from a wide variety of sustainable sources represents a significant opportunity for commercial aviation to reduce its carbon footprint and emissions. Scientific studies have shown that biofuels produce up to 80 percent lower life-cycle greenhouse gas emissions than petroleum fuel while supporting economic growth, particularly in rural areas.

Five sustainable aviation fuel production methods, or pathways, have been approved for use in commercial aviation. These fuels are "drop-in" substitutes for petroleum fuels,

requiring no modification to airplanes, engines or fuel delivery infrastructure. Boeing led the approval of the first pathway in 2011 and that fuel has been flown successfully on thousands of commercial flights. Boeing continues to work tirelessly within ASTM, the international standards body, to secure approval of more pathways.

As part of its work, Boeing works with partners on six continents to research, develop and commercialize new sources of aviation biofuel. Boeing collaborates with airlines, governments, non-governmental organizations and private entities to create and execute regional biofuel roadmaps in the United States, Canada, China, Brazil, Mexico, Europe, the Middle East, South Africa and Australia. These roadmaps have led to biofuel projects utilizing sustainably produced regional feedstocks such as saltwater-tolerant plants in the United Arab Emirates, nicotine-free tobacco in South Africa and agriculture waste in China.

Boeing is also partnering with the FAA and other stakeholders to gain approval for a biofuel called HEFA+, which is produced from fats, oils and greases. To verify this fuel's performance and characteristics, Boeing tested two blends of HEFA+ on its ecoDemonstrator program using 787 and 757 flight test airplanes.

Known as "green diesel" in ground transport, global production capacity exceeds 1 billion gallons annually. Approval of this fuel would make a price-competitive sustainable supply available that could meet more than 1 percent of global aviation needs.

The commercialization of biofuel is steadily growing. More than 172,000 passenger flights have flown on a blend of biofuel and petroleum fuel and that number grows every day. All flights departing from Oslo, Bergen, Stockholm and Los Angeles regularly use biofuel, and a number of other airports are working to offer it. Such near-term efforts and success will stimulate the market to continue to grow and develop additional biofuel technologies and sources.