

# Aviation faces hurdles to hit goals for cutting emissions

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A Boeing 777X plane takes off at the Farnborough Air Show fair in Farnborough, England, Monday, July 18, 2022. Some 1200 exhibitors from around the world will show their newest developments in Future Flight, Space, Defence, Innovation, Sustainability and Workforce from July 18 until July 22, 2022. Credit: AP Photo/Frank Augstein

Airplanes are a minor contributor to [global greenhouse-gas emissions](#), but their share is sure to grow as more people travel in coming years—and that has the aviation industry facing the prospect of tighter environmental regulations and higher costs.

The industry has embraced a goal of reaching net-zero greenhouse-gas emissions by 2050. Experts who track the issue are skeptical.

Until the COVID-19 pandemic caused travel to slump, airlines were on a steady course of burning more fuel, year after year. Today's aircraft engines are the most efficient ever, but improvements in reducing fuel burn are agonizingly slow—about 1% a year on average.

At Monday's opening of a huge aviation industry show near London, discussion about climate change replaced much of the usual buzz over big airplane orders.

The weather was fitting. The Farnborough International Airshow opened as U.K. authorities issued the first extreme heat warning in England's history. Two nearby airports closed their runways, one reporting that heat caused the surface to buckle.

As airlines confront climate change, the stakes could hardly be higher.

Jim Harris, who leads the aerospace practice at consultant Bain & Co., says that with airlines recovering from the jolt of the pandemic, hitting net-zero by 2050 is now the industry's biggest challenge.



A Boeing 747 takes off from the airport in Frankfurt, Germany, on Aug. 7, 2020. Airplanes are a minor contributor to global greenhouse-gas emissions, but their share is sure to grow as more people travel in coming years, and that has the aviation industry facing the prospect of tighter environmental regulations and higher costs. At the opening of a huge aviation industry show near London, on Monday, July 18, 2022, discussion about climate change replaced much of the usual buzz over big airplane orders. Credit: AP Photo/Michael Probst, File

"There is no obvious solution, there is no one technology, there is no one set of actions that are going to get the industry there," Harris says. "The amount of change required, and the timeline, are big issues."

Aviation releases only one-sixth the amount of carbon dioxide produced

by cars and trucks, according to World Resources Institute, a nonprofit research group based in Washington. However, aviation is used by far fewer people per day.

Jet fuel use by the four biggest U.S. airlines—American, United, Delta and Southwest—rose 15% in the five years leading up to 2019, the last year before air travel dropped, even as they updated their fleets with more efficient planes.

Airbus and Boeing, the world's two biggest aircraft makers, both addressed sustainability during Monday's opening day at Farnborough, although they approached the issue in different ways.



A visitor checks an airplane engine made by Pratt & Whitney at the Farnborough Air Show fair in Farnborough, England, Monday, July 18, 2022. Some 1191

exhibitors from around the world show their newest developments in Future Flight, Space, Defence, Innovation, Sustainability and Workforce from July 18th until July 22, 2022. Credit: AP Photo/Frank Augstein

Europe's Airbus and seven airline groups announced a venture in West Texas to explore removing carbon dioxide from the air and injecting it deep underground, while Boeing officials said sustainable aviation fuel, or SAF, will be the best tool—but not the only one—to reduce emissions.

Last September, airline leaders and [President Joe Biden touted an agreement](#) to cut aircraft emissions 20% by 2030 by producing 3 billion gallons of SAF by then and replacing all conventional jet fuel by 2050. Climate experts praised the idea but said the voluntary targets are overly optimistic. Current SAF production is around 5 million gallons per year.

Sustainable fuel is biofuel made from cooking oil, animal fats, municipal waste or other feedstocks. Its chief advantage is that it can be blended with conventional fuel to power jet engines. It has been used many times on test flights and even regular flights with passengers on board.

Among SAF's drawbacks are the high cost—about three times more than conventional jet fuel. As airlines seek to buy and use more of it, the price will rise further. Advocates are lobbying for tax breaks and other incentives to boost production.





A Boeing 777X plane flies past at the Farnborough Air Show fair in Farnborough, England, Monday, July 18, 2022. Some 1200 exhibitors from around the world will show their newest developments in Future Flight, Space, Defence, Innovation, Sustainability and Workforce from July 18 until July 22, 2022.  
Credit: AP Photo/Frank Augstein

Policymakers see SAF as a bridge fuel—a way to reduce emissions until more dramatic breakthroughs, such as electric- or hydrogen-powered planes, are ready. Those technologies might not be widely available for airline-size planes for two or three decades.

Several companies are designing and starting to build electric-powered planes, but most are small aircraft that take off and land vertically, like helicopters, and they are about the same size—with room for only a few

passengers.

Electric-powered planes big enough to carry around 200 passengers—a medium-size jet by airline standards—would require much bigger batteries for longer flights. The batteries would weigh about 40 times more than jet fuel to produce the same amount of power, making electric airliners impractical without huge leaps in battery technology.

Hydrogen, on the other hand, "is a very light fuel," says Dan Rutherford, who leads the study of decarbonizing cars and planes for an environmental group, the International Council on Clean Transportation. "But you need a lot of volume to store it, and the fuel tanks themselves are heavy."



Boeing personnel sit in the shade in front of a Boeing 737 at the Farnborough Air Show fair in Farnborough, England, Monday, July 18, 2022. Some 1191 exhibitors from around the world show their newest developments in future flight, space, defence, innovation, sustainability and workforce from July 18 until July 22, 2022. Credit: AP Photo/Frank Augstein

Despite that, Rutherford remains "cautiously optimistic" about hydrogen. His group believes that by 2035, there could be hydrogen-powered planes capable of flying about 2,100 miles (3,380 kilometers). Others, however, see obstacles including the need for massive and expensive new infrastructure at airports to store hydrogen that has been chilled into liquid form.

Airlines face the risk of increasingly tough emissions regulations.

The U.N. aviation organization [reached an agreement](#)—voluntary until 2026, then mandatory—in which airlines can offset their emissions by investing in projects to reduce greenhouse gases in other ways. However, some major countries didn't sign it, and environmentalists say the scheme won't reduce emissions.

Even some in the airline industry, such as United Airlines CEO Scott Kirby, have mocked carbon offsets, which companies can get for things like paying to plant trees.





People rest in a shady place during a heatwave as they attend the Farnborough Air Show fair in Farnborough, England, Monday, July 18, 2022. Some 1191 exhibitors from around the world show their newest developments in Future Flight, Space, Defence, Innovation, Sustainability and Workforce from July 18th until July 22, 2022. Credit: AP Photo/Frank Augstein

The European Union has its own [plan to slash emissions](#) 55% by 2030 and reach net zero by 2050 while bringing aviation under the goals of the 2015 Paris agreement on climate change. It is trying to finalize an emissions-trading system and impose higher taxes on fossil fuels including jet fuel. The rules would apply only to flights within Europe.

"The taxation policies that are already in place, particularly in Europe, are going to drive the cost of operations for airlines way up," says Harris,

the Bain consultant. "Ultimately, fares rise whether it be paying more for sustainable aviation fuel or it's taxes on fossil fuels."

Airlines also face the risk of flight shaming—that more consumers could decide to travel by train or electric vehicle instead of by plane if those produce lower emissions. That does not seem to be inhibiting many travelers this summer, however, as pent-up travel demand has led to full planes.

Whether changes in fuel and planes can cut emissions fast enough to hit the industry 2050 target—and whether airlines act on their own or under pressure from regulators—remains to be seen. But it won't be easy.



An Airbus A350-900 is on display at the Farnborough Air Show fair in Farnborough, England, Monday, July 18, 2022. Some 1191 exhibitors from



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A mechanic checks the engine of a Boeing 737 at the Farnborough Air Show fair in Farnborough, England, Monday, July 18, 2022. Some 1191 exhibitors from around the world show their newest developments in Future Flight, Space, Defence, Innovation, Sustainability and Workforce from July 18th until July 22, 2022. Credit: AP Photo/Frank Augstein

**"We're not on a path to deliver those goals," Delta Air Lines CEO Ed Bastian says. "We need the energy producers to invest in sustainable**

product for us, (which) is going to require government to come in."

Rutherford, the transportation expert, notes that net zero "is a really challenging target."

"If we aren't clearly on a trajectory of down emissions and massive uptake of clean fuels by 2030 and 2035, we are not going to hit net zero in 2050," he says.

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