

In 30 years, your summer plane flight may be a little more expensive. It could also be carbon-free

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As millions of Americans hop on airplanes heading to favorite vacation spots, the industry is gearing for a bigger journey—one that will tackle

removing the carbon emissions from those flights over the next 30 years.

To achieve that goal by 2050, a report released by an international transportation group Thursday found research and support are needed quickly. It will make air travel a little more expensive but won't mean going back to the days of sailing ships and dirigibles.

But it has to happen now, they said.

"We can't wait until 2040 to start making plans and then be like, 'Oops, we don't have the money, this is not achievable,'" said Brandon Graver, a senior researcher at the International Council on Clean Transportation, which produced the study. "We need to ramp up quickly and we need to put in the financial resources to do so."

Air travel currently produces about 3% of the carbon dioxide that causes climate change. The United States has committed to reaching net-zero greenhouse gas emissions from its [aviation sector](#) by 2050.

Getting carbon out of [aviation](#) is part of a larger fight to remove it from the global economy. This spring, the Intergovernmental Panel on Climate Change said humanity is not on track to stay under the goal set by scientists in 2018 of 1.5 degrees Celsius (2.7 degrees Fahrenheit) average global temperature rise.

Last week, scientists said the amount of carbon dioxide in the Earth's atmosphere is now more than 50% higher than pre-industrial times and has reached levels not seen since millions of years ago when Earth was a hothouse ocean-inundated planet.

Keeping current levels from going any higher means getting carbon out of every nook and cranny of the global economy, including aviation. But getting from today's fossil fuel-powered planes to net-zero flights is

likely to be a bumpy ride.

Because jet fuel, effectively kerosene, must pack a lot of energy into a small space, aviation is considered one of the harder-to-decarbonize parts of the economy. But experts say that doesn't mean it's impossible.

There are several solutions in the works, though all require more research, development, investment and regulation to fully implement.

The most pressing is the development of sustainable aviation fuels, or SAFs, now still in their infancy.

"It's a very ambitious goal," said Sharon Pinkerton, senior vice president for legislative and regulatory policy with Airlines for America, the airline industry association.

"We really need to move the technological development process forward at lightning speed," she said. "Fuel producers need some incentives to get over the cost barriers that exist."

The U.S. government has set a goal of going from the 5 million gallons of SAFs currently produced to 3 billion gallons by 2030. That's out of 20 billion gallons of jet fuel burned by U.S. airline carriers every year.

Scientists at the Argonne National Laboratory in Illinois have been working on the problem of creating sustainable jet fuel since 2012, said Michael Wang, director of energy systems and infrastructure analysis at the lab.

With the right incentives, he said, current sustainable jet fuels could get to a 50% reduction in greenhouse gas emissions, paving the way for what's known as e-fuel.

The eventual goal is to use cheap and plentiful power from wind and solar installations, together with [carbon dioxide](#) from either agricultural residue or direct-air capture, to create the high-energy fuel airplanes need to fly.

While the timeline is rapid and the technology still being put together, in the end carbon-neutral [jet fuel](#) could totally transform aviation, said Pedro Piris-Cabezas, director for sustainable International transport with the Environmental Defense Fund

"As soon as we start bringing this energy to the table, there's a bright future for aviation," he said.

Creating these third-generation fuels will require investment and policy support from the European Union and the United States. "That's the only way to really boost the ingenuity we need," Piris-Cabezas said.

What's the 'impact on aviation'?

The e-fuels will be more expensive, but not horrifically so, he said. His team has calculated that when fully developed, carbon-neutral fuel would add about \$80 to the cost of a round-trip ticket between San Francisco and New York.

"It's obvious this will have an impact on aviation but it's not as large as anticipated in other studies," he said.

The ICCT report estimates increases in fuel costs will result in only modest reductions in air travel, about 2.5% of the total.

The ICCT report offers various scenarios for the aviation industry, All require a shift to more than 60% sustainable aircraft fuel and improvements to aircraft efficiency. and somewhere close to 5% of

flights powered by hydrogen fuel cells. There's also an expected modest reduction of about 2.5% a year in [air travel](#) as costs rise.

While lots of initiatives are underway, no single decision has been made. The International Civil Aviation Organization is discussing the matter and is expected to put forward a plan in September.

The airline industry is being to coalesce around a roadmap of what's feasible and what's needed to achieve it, said Graver.

In addition to sustainable fuel, the industry is working on ever more efficient planes, some powered by either electricity or hydrogen. These are still in development and would only be for short flights as they can't efficiently carry enough energy for long-haul routes.

The scope of the problem is sobering, Graver admitted, but he's optimistic.

"Twenty years ago we weren't thinking of hydrogen and electric aircraft, or even sustainable aviation fuels. We were thinking of four-engine aircraft and now we're down to two-engine aircraft going longer distances and built from composite materials. New things are constantly coming out," he said.

"There's a problem, we're going to solve it. It's going to take time and energy, but we'll get there."

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