

Slipstream: planes could cut emissions by ‘surfing wind’

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“Surfing the wind” sounds dreamy, but it could be a useful means of finding efficiencies for aircraft and reducing the use of environmentally damaging fossil fuels, research suggests.



In particular, researchers said by utilising the jet stream – in which ribbons of air flow at high altitude from west to east around the planet, reaching speeds of up to 200mph – transatlantic flights could save significant amounts of fuel.

The team of scientists from the University of Reading said commercial flights between New York and London last winter could have used up to 16 per cent less fuel if they had hitched a ride on the jet stream.

Air traffic controllers already use knowledge of the jet stream – which can fluctuate in speed, location and shape – to assist some flights, but the scientists said further flexibility to seek out the most favourable currents would have major benefits for flyers, airlines and the environment.

Cathie Wells, a PhD researcher in mathematics at the University of Reading and lead author of the research, said: “Current transatlantic flight paths mean aircraft are burning more fuel and emitting more carbon dioxide than they need to.

“Although winds are taken into account to some degree when planning routes, considerations such as reducing the total cost of operating the flight are currently given a higher priority than minimising the fuel burn and pollution.”

The researchers said that while aircraft technology was struggling to keep pace with

changes seen in other sectors, such as the electrification of rail and the rise in electric road vehicles, adopting changes to flight paths to maximise efficiency could happen rapidly.

Professor Paul Williams, an atmospheric scientist at the University of Reading and co-author of the study, said: "Upgrading to more efficient aircraft or switching to biofuels or batteries could lower emissions significantly, but will be costly and may take decades to achieve.

"Simple tweaks to flight paths are far cheaper and can offer benefits immediately. This is important, because lower emissions from aviation are urgently needed to reduce the future impacts of climate change."

The researchers compared the fuel used during these flights with the quickest route that would have been possible at the time by flying into or around the eastward jet stream air currents.

The scientists found taking better advantage of the winds would have saved around 200 kilometres (125 miles) worth of fuel per flight on average.

This would have added up to a total saving of 6.7 million kilograms of carbon dioxide emissions from going into the atmosphere across this one winter period.

The average fuel saving per flight was 1.7 per cent when flying west to New York and 2.5 per cent when flying east to London.

Aviation is currently responsible for around 2.4 per cent of all human-caused carbon emissions, and this figure is still growing.

The International Civil Aviation Organisation and countries around the world have responded by establishing policies to improve the fuel efficiency of international flights or offset emissions, but most of this action relies on technological advances and is therefore costly and slow to implement.

The impacts of the climate crisis are also likely to have a physical impact on air travel, with previous University of Reading research indicating flights will encounter two or three times more severe clear-air turbulence if current levels of emissions are maintained.

Before the pandemic, global air passenger numbers grew by 3.3 per cent, with UK surveys indicating that although people in the UK were increasingly concerned about aviation emissions, they were also reluctant to fly less.

The study is published in the journal *Environmental Research Letters*.