CO2 COALITION
SCIENCE & POLICY BRIEF
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Do Jet Planes Warm the Atmosphere?

Recent evidence indicates the answer is "yes," but largely not from CO_2 emissions

Our CO2 Coalition's Articles webpage recently linked to a new paper on global aviation and climate change, which seems very timely given that flying has been greatly affected by the coronavirus pandemic.

According to the UN's International Civil Aviation Organization (ICAO), passenger revenue loss to US airlines due to COVID-19 totaled $71 billion through September. And worldwide passenger numbers are down around 60 percent. The big legacy carriers are nearing fatal financial trouble, which is likely to provoke a major debate about the future role of air travel.

Part of that debate will be over the contribution of aviation to global warming. If the Biden/Harris team wins in November and takes the Senate, there will be tremendous pressure from the far left to commit the US to "net-zero" carbon dioxide emissions, and every time the government will have a chance to intervene on transportation, climate change will come up.

About the Author

Dr. Patrick Michaels, the former president of the American Association of State Climatologists, is the author of a number of books on science, including *Lukewarming: The New Climate Science that Changes Everything* (2016) and *Scientocracy: The Tangled Web of Public Policy and Public Science* (2019). He is a senior fellow at both the CO2 Coalition and the Competitive Enterprise Institute, although his views here are his own.

Besides emitting carbon dioxide from the combustion of Jet-A fuel, aircraft artificially increase cloudiness when their contrails grow into large cirrus (ice crystal) clouds.

As shown in the comprehensive paper, by D.S. Lee of Manchester Metropolitan University (U.K.) along with twenty coauthors, the net effect of these clouds is warming, particularly at night. This is most evident under calm conditions on winter nights, when cloud decks greatly inhibit the rapid cooling that would normally occur.

Cirrus and other clouds reflect away a substantial amount of incoming solar radiation, but their net daytime effect is still a slight warming. At night, there's no sun, so more cirrus clouds only serve to enhance warming.

Lee and his colleagues show that the non-CO_2 warming effects from aviation comprise about 2/3 of its total warming, which itself is about 3.5 percent of the total human contribution.

That means aviation itself—via cloud generation—is a contributor to warming beyond just the greenhouse gas (CO_2) effect, which will make rescuing the industry a very large political football.

Note that the contrail effect is mainly in winter and at night. Is this necessarily a bad thing? A slight warming of the winter night would logically reduce the emissions from carbon dioxide associated with heating your house. Lee et al. merely conclude that "aviation emissions and cloud effects remain a continued focus of anthropogenic climate change research and policy discussions."

Science & Policy Briefs

This series summarizes issues that are addressed in more detail in our White Papers and *Climate Issues in Depth* publications. Those are available at www.co2coalition.org.