

New planes could cut aviation carbon emissions

March 31 2014, by Alex Peel



Policies that encourage airlines to replace the old planes in their fleet with newer models could lead to substantial cuts in aviation carbon emissions, according to new research.

The study, published in the journal *Transport Policy*, assessed the potential impact of a policy to use the revenues of a [carbon tax](#) to subsidise the replacement of older aircraft. It found that such a policy could reduce aviation [emissions](#) by up to a third by 2050, relative to a business-as-usual scenario.

In a separate study, the scientists tested the effect of replacing every existing plane with an up-to-date model. This, they say, would deliver an immediate emissions cut of ten per cent.

'Neither scenario is realistic in practise; this is certainly not a policy recommendation,' says Dr Lynnette Dray, from the University of Cambridge, who led the study. 'But it's a useful exercise in demonstrating the effect that aging technology is having on aviation emissions.'

'Aviation is one of the few areas where emissions are still growing. Over the last 30 to 40 years, they've grown at a rate of about two and a half per cent a year.'

'Part of the reason why it's so difficult to curb aviation emissions is the long lifetime of planes. They're designed to keep going for 30 or more years, so the feed-through of new, cleaner technology is a relatively slow process.'

The team assessed the policies using a detailed computer simulation of the whole aviation industry, incorporating predictions of passenger demand, oil prices, global schedules and changes to airport capacity among other factors.

Neither policy is ever likely to emerge in reality. A global carbon tax would require strong international co-operation, and such a move would face strong resistance from the aviation industry.

The EU Emissions Trading Scheme has included aviation since 2012. The scheme applies an emissions cap on flights within the EU. If airlines exceed those limits, they can buy allowance from industries which are able to reduce their emissions more easily.

Plans to extend the scheme to flights to and from countries outside of the EU have faced long delays.

The EU has set a target to reduce [greenhouse gas emissions](#) from

transport by up to 60 per cent by 2050. Neither of the radical policies explored in Dray's research can bring aviation anywhere near that target.

'Those are quite aspirational targets,' says Dray. 'To achieve them, it's probably going to take some sort of unforeseen disruptive technology or a marked reduction in the number of people travelling, and that's something that we can't account for in these models.'

'The [aviation industry](#) rightly has a strong focus on safety. But this can sometimes make the take-up of new technology rather slow. All new technologies have to be balanced with safety, and the industry tends to stick with what they know is safe.'

'There was good progress on an [aviation](#) biofuel, but that has come up against issues of supply and land-use change. If those barriers can be overcome, perhaps they can make a strong contribution.'

The team will now focus their research on the effects of making some low-cost modifications to existing planes to reduce their emissions. These include installing light-weight cabins and seats, and retrofitting the aircraft with winglets to improve their aerodynamic performance.

More information: Dray L, Evans A, Reynolds T, Schafer AW, Vera-Morales M, Bosbach W, "Airline fleet replacement funded by a carbon tax: An integrated assessment," *Transport Policy*, 2014.

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