

My name is Pete Knapp, an air quality researcher from Imperial College London. I will start by speaking from the perspective of air quality, and I support all the arguments you will hopefully continue to hear about carbon emissions and their effect on the climate and ecological emergency.

The government claims that airport expansions are at 'low risk' of breaking the limits of air quality, but this is because we are measuring total particle mass instead of total particle number. Jet engines produce particles that are very small, with 85-90% of particles too small to measure with the sensors around airports. When they are small, many particles can weigh very little.

Ultrafine particles, those under 100nm are called PM0.1. Only 4 monitoring stations in the UK routinely measure PM0.1, with none around any major airports. This is a concern, because PM0.1 may affect humans in different ways to the typically measured PM2.5 and could be more toxic because their higher surface area enables them to carry more toxic material like heavy metals. PM0.1 is found in higher concentrations under landing jet pathways. A 2003 study showed LAX airport increased the particle number in the city by more than ten times its background level. This is because aeroplane fuel has much less stringent limits on the amount of sulphur, at 300 times greater than road fuel. This is mostly to save money. This sulphur creates huge numbers of tiny particles that can extend to a range over 40km from a major airport.

Passenger planes burn through around 4 litres of fuel per second, and this rises to 5.5 litres/sec during takeoff.

Jet engine particles and commercial airport particles both contain toxic heavy metal particles including lead, cobalt, nickel, arsenic, cadmium and mercury.

Adding together the airmiles of all airline passengers in 2018 totals 8269 billion km, which is equivalent to taking 1000 return trips to Pluto... in one year. This continued to rise at 5% every year between 2013-2018 and, although there was a 90% decline from Feb to Apr 2020, they are quickly returning to pre-pandemic levels and flying is continuously encouraged by the media and the UK government. Regarding the carbon emissions created by flying, a return flight to Australia from the UK produces around 4000 kg of CO₂, which wipes out 20 years of recycling (saving 200 kg CO₂e per year), or 5 years of eating a plant-based diet (saving 800 kg CO₂e per year). Around 1% of the world population emits 50% of CO₂ from commercial flying, highlighting the wealth inequality of flying, and affirms that current climate policy for aviation is inadequate. If other emissions, such as NO_x, soot, and cloud formation are included, the warming effect of aviation could be four times greater than CO₂ alone, accounting for up to 7% of global CO₂e emissions, and up to two thirds of the UK's carbon budget for 1.5C by 2050.

Offsetting schemes are a con. The term makes it sound like all of your emissions are absorbed elsewhere, but 85% of offsetting schemes failed to reduce emissions at all, with EasyJet's trees being cut down before maturity and cook-stove projects likely to considerably over-estimate the emission

reductions due to a number of unrealistic assumptions and default values. Ryanair's offsetting reduces less than 0.01% of their emissions. No offsetting schemes reduce air pollution generated around airports. 'Sustainable aviation fuel' is also a con, with issues around crops coming from deforested land or land that would be better used to produce forests or food, rather than plane fuel.

If we want to improve infrastructure, we should be concentrating our efforts on developing public transport rather than expanding fossil-fuel dependent air travel, reducing aviation subsidies despite the larger economic returns, educating the UK's Secretary of State for Transport who wants to 'speed up the return of flights' after covid, and discouraging polluting and carbon intensive private car ownership and demand for rapid international items.

It is our duty as global citizens to reduce pollution and global heating, and expanding airports is the exact opposite. For this reason, I strongly oppose the expansion of Bristol airport.

For sources, please find them under the Airport expansions section here:

<https://www.scientistsforxr.earth/air-pollution>