Written Representation

Jacqueline Phillips, IP reference number 20044655

I am opposed to Gatwick's expansion plans on climate grounds. GAL claims that it 'recognises fully the urgency of tackling global climate change and reducing global greenhouse gas emissions, to which aviation is a major contributor' (PS 2.6.6) Can GAL explain why it thinks airport expansion is consistent with recognising the above?

Given it's recognition of the urgency to tackle global climate change and to reduce emissions does GAL consider that basing its greenhouse gas emissions scenarios on a Jet Zero Strategy, which the Governments advisers the Climate Change Committee describe as "high risk due to its reliance on nascent technology", is a reasonable or responsible approach?

This is the text, with references, of my oral submission (Open Hearing 2):

I am opposed to Gatwick's expansion plans for the sake of all life on our wonderful planet. A planet that we rely on to live – It is our life support system. (Appendix item 1)

We are systematically polluting air, poisoning soil and contaminating water. Destroying the basis for life on earth. Why? Largely to extract profit for the sake of business and growing the economy. To profit a few people at the expense of the many. This again seems to be the premise for Gatwick's new runway proposals.

World scientists have warned that we are at 'code red' for humanity and facing immense suffering and societal collapse if we do not act now to reduce the harm we are causing. (Appendix item 2)

It seems to me that to propose airport expansion at this time of climate crisis is literally insane. More emissions, mean more warming is locked in. Every fraction of a degree of warming matters and impacts lives.

Aviation is a difficult sector to decarbonise.

It is magical thinking to imagine that Gatwick can expand to the size of Heathrow and not jeopardise the Government's legal climate commitment for net zero by 2050, – the technology and biofuels that it imagines do not yet exist at anywhere near the scale required.

The reliance on carbon capturing technology embodies ‘very significant risk’ (Appendix item 3)

The Executive Director of the IEA acknowledged last year that the history of carbon capture to date has largely been a disappointment. (Appendix item 4)

Carbon offsetting is a dangerous distraction. (Appendix item 5)

The ability to procure Sustainable Aviation Fuel on the scale envisioned is highly debatable. Will bring into competition with other sectors also looking to rely on this to decarbonise ie ground transport.

Moreover, there is limited ‘sustainable waste’ available from which to make SAFs.

Thus the demand for biofuel also has implication for environmental harm, deforestation and biodiversity loss, use of pesticides and fertilisers and also impacts land available for growing food. Making first generation biofuels from crops has not been ruled out. (Appendix item 6)

Overreliance on unproven technologies delays climate action and a rush into technological fixes often just replace one problem with another.

Put simply, as the Climate Change Committee makes clear, airport expansion is incompatible with meeting climate commitments. (Appendix item 7)

When extolling the economic benefits of expansion, have detrimental costs of health impacts to local populations and airport workers been considered? (Appendix item 8) Has the cost of the impact of emissions in exacerbating global heating and extreme weather which causes disruption been taking into account? (Appendix item 9)

This is an issue of justice. Aircraft noise, emissions and related health issues fall disproportionately on low-income communities and airport workers – people who pay the price for the activities of more affluent groups who tend to fly more regularly. It is the opposite of levelling up.

To tackle health issues and the climate crisis we need to reduce demand for highly polluting industries, like aviation.

Airport expansion feeds demand,

When faced with ‘code red’ for humanity, it is not okay to hope that future fuels and technologies will save the day. This is taking a risky and unnecessary costly gamble with the lives of those living today and of future generations. The Jet Zero Strategy is an Abdication of Responsibility to the Planet and Future Generations.

Countless reports make it clear that ***reducing*** demand, reducing the number of flights and stopping airport expansion are the no-brainer best ways to reduce dangerous pollution and emissions to tackle the climate crisis. (Appendix 9, 10, 11, 12)

APPENDIX

1.

The Earth System: Sustaining Planetary Life-Support Systems, Principles of Ecosystem Stewardship (book) Oran R. Young & Will Steffen, January 2009

Abstract

The Earth as a whole can be viewed as a social–ecological system; in fact, the largest such system that can exist. The increasing evidence that human activities are now interacting with the natural environment of the Earth at the scale of the planet lends credence to this perspective. The scientific understanding of the human imprint on the planet is well recognized throughout the policy and management sectors and is raising severe challenges to governance structures. Never before has humanity had to devise and implement governance structures at the planetary scale, crossing national boundaries, continents and large biogeographic regions. Responsible stewardship of the global social–ecological system is the ultimate challenge facing humanity, as it entails safeguarding our own life-support system. The Earth as a social–ecological system is a very recent phenomenon. For nearly all of its existence, Earth has operated as a biophysical system, without the social component, as fully modern Homo sapiens arose only about 200,000–250,000 years ago. This long evolution of Earth as a biophysical system provides the canvas on which the human enterprise has exploded with exponentially growing impact in the last micro-instant of Earth's existence. A full understanding of the implications of this phenomenon requires an understanding of Earth as a system, and particularly the natural envelope of environmental variability that provides the conditions for human life on the planet.

2.

World Scientists' Warning of a Climate Emergency 2022

William J Ripple, Christopher Wolf, Jillian W Gregg, Kelly Levin, Johan Rockström, Thomas M Newsome, Matthew G Betts, Saleemul Huq, Beverly E Law, Luke Kemp, Peter Kalmus, Timothy M Lenton, *BioScience*, Volume 72, Issue 12, December 2022

We are now at "code red" on planet Earth. Humanity is unequivocally facing a climate emergency. The scale of untold human suffering, already immense, is rapidly growing with the escalating number of climate-related disasters. Therefore, we urge scientists, citizens, and world leaders to read this Special Report and quickly take the necessary actions to avoid the worst effects of climate change.

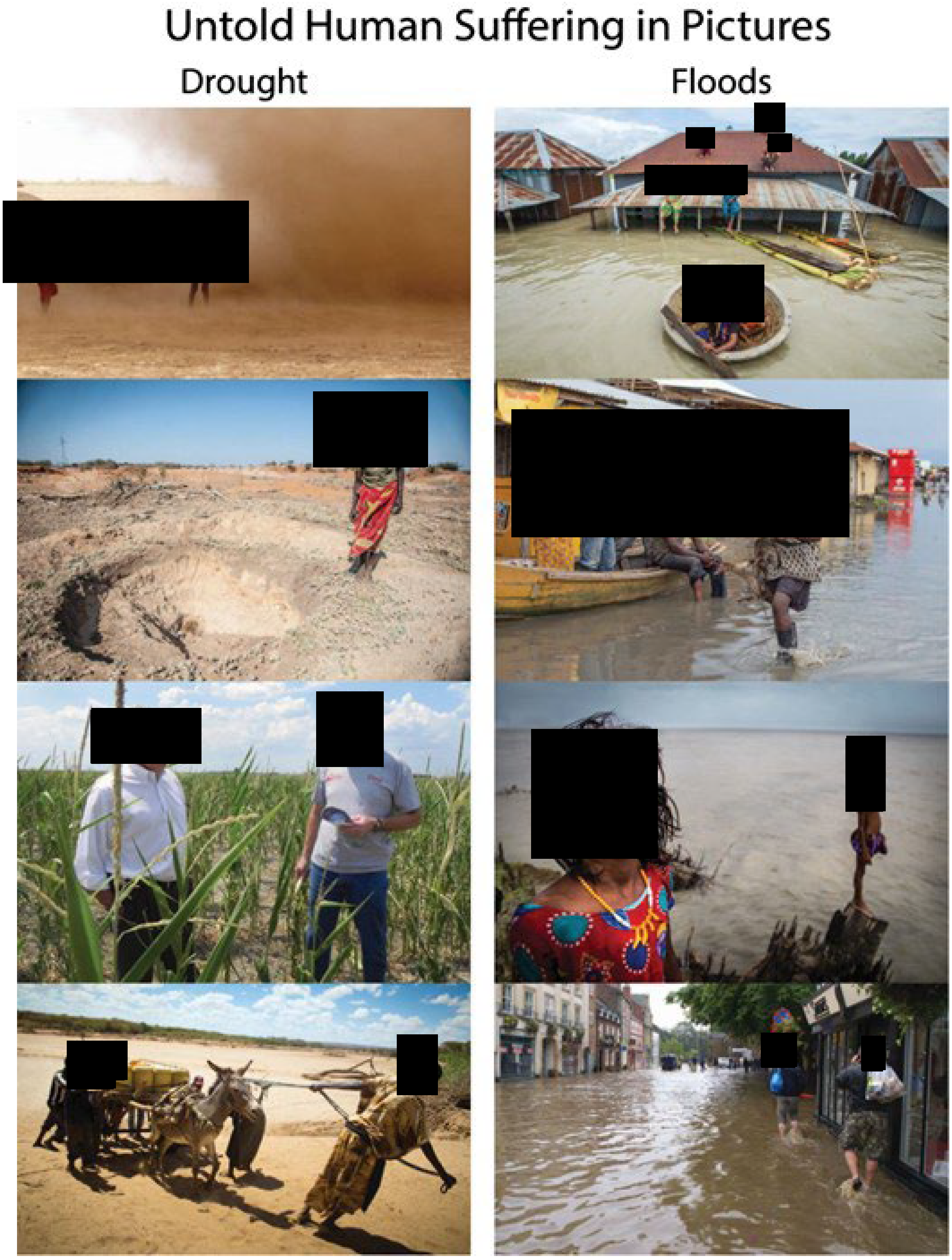
2022 marks the 30th anniversary of the "World Scientists' Warning to Humanity," signed by more than 1700 scientists in 1992. Since this original warning, there has been a roughly 40% increase in global greenhouse gas emissions. This is despite numerous written warnings from the Intergovernmental Panel on Climate Change and a recent scientists' warning of a climate emergency with nearly 15,000 signatories from 158 countries (Ripple et al. 2020). Current policies are taking the planet to around 3 degrees Celsius warming by 2100, a temperature level that Earth has not experienced over the past 3 million years (Liu and Raftery 2021). The consequences of global heating are becoming increasingly extreme, and outcomes such as global societal collapse are plausible and dangerously underexplored (Kemp et al. 2022). Motivated by the moral urgency of this global crisis, here, we track recent climate-related disasters, assess planetary vital signs, and provide sweeping policy recommendations.

Climate-related extreme weather

Climate change has increased the frequency and intensity of severe weather events across the world (Coronese et al. 2019). This is likely because of a variety of interconnected processes, including an overall warming trend, changing precipitation patterns, rising sea levels, and changes in the jet streams. For example, rapid Arctic warming may have made the summer jet stream in the Northern Hemisphere more prone to meandering and becoming blocked, causing heat waves, flooding, droughts, and other disasters (Mann et al. 2017). Rather than just being more frequent, some extreme weather events are now more intense or sometimes occur closer together in time and space. This compounds damage and decreases recovery time. It may increase the likelihood of extreme risks such as simultaneous global failure of crop yields across multiple major food producing regions.

We are now regularly seeing events and disasters that previously occurred only rarely. Tragically, these disasters disproportionately harm poor people in low-income regions that have had minimal contributions to the buildup of greenhouse gasses. For example, in the summer of 2022, one third of Pakistan was flooded, displacing 33 million people and affecting 16 million children. Other disasters this year include terrifying wildfires in Europe, back-to-back cyclones and subsequent flooding in eastern Australia, numerous rivers drying up in China and Europe, an extraordinarily intense hurricane striking the Southeastern United States, powerful storms and extensive flooding in Bangladesh and India, megafires and a continuation of the decadal drought in the western United States, a massive flood that closed Yellowstone National Park, and unusually severe heat waves or “heat domes” in many parts of the Northern Hemisphere (see table 1 for details and attribution). These serial and simultaneous impacts are testing society’s limits as they greatly reduce resilience and ability to cope with other crises. To illustrate these impacts, we provide a photo series, documenting the human cost of climate-related disasters (figure 1, supplemental file S1).

Figure 1.



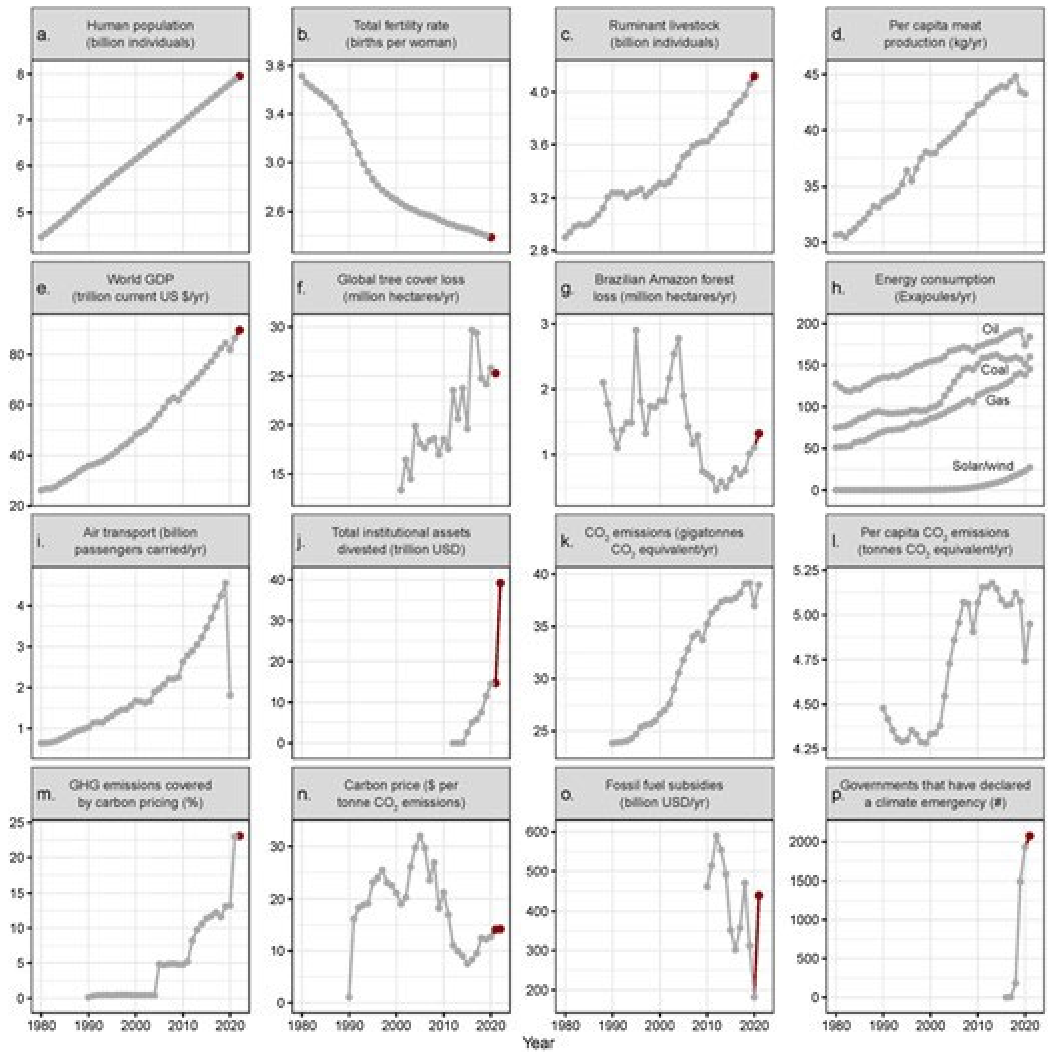
The impacts of climate-related droughts (left column) and floods (right column). Left column (top to bottom): “Children in dust storm” (Ethiopia, 2016; photograph: Anouk Delafortrie/EU/ECHO), a water hole that may have become empty because of drought (Mozambique, 2016; photograph: Aurélie Marrier d'Unienville/IFRC), drought-affected corn field in Paulding County, Ohio (United States, 2012; photograph: US Department of Agriculture/Christina Reed), “Drought in Kenya's Ewaso Ngiro river basin” (Kenya, 2017; photograph: Denis Onyodi/Denis Onyodi/KRCS). Right column (top to bottom): houses are nearly submerged by flooding (Bangladesh, 2020; photograph: Moniruzzaman

Sazal/Climate Visuals Countdown), “A girl, duck in hand wades through the water in Rwangara” (Uganda, 2020; photograph: Climate Centre), “two children a boy and a girl on a flooded riverbank” (Bangladesh, 2018; photograph: Moniruzzaman Sazal/Climate Visuals Countdown), “Residents wade through flooded streets to escape flood waters” (United Kingdom, 2008; John Dal). All photos are licensed under Creative Commons and all quotes are from the Climate Visuals project (https://climatevisuals.org). See supplemental file S1 for details and more pictures.

Recent trends in planetary vital signs

Updating the planetary vital signs first published by Ripple and colleagues (2020) provides a simple but powerful way to track changes in potential climate drivers (figure 2) and impacts (figure 3). In total, 16 of the 35 variables that we track are at record extremes based on the time series data (supplemental table S1). We discuss some of these vital signs below.

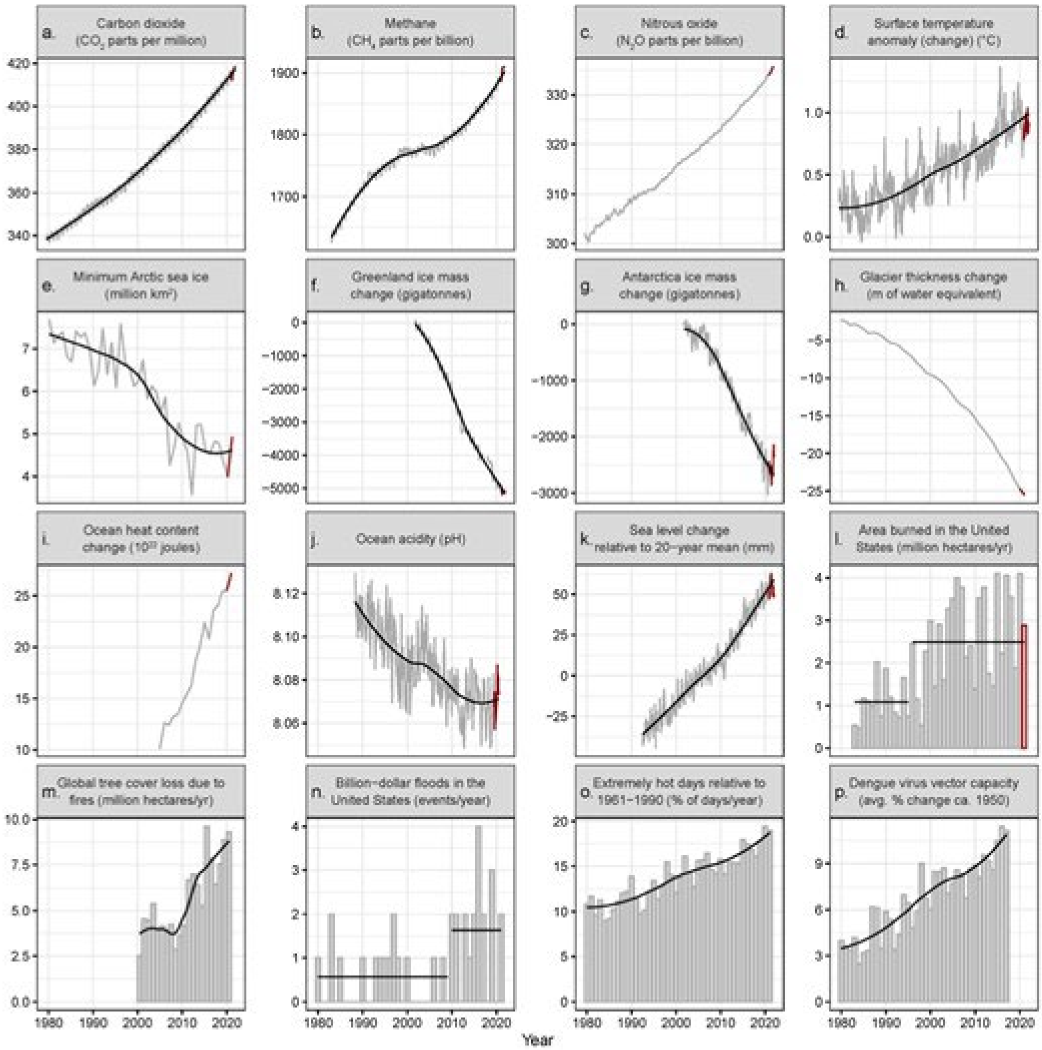
Figure 2.



Open in new tabDownload slide

Time series of climate-related human activities. Data obtained since the publication of Ripple and colleagues (2021) are shown in red (dark gray in print). In panel (f), tree cover loss does not account for forest gain and includes loss due to any cause. For panel (h), hydroelectricity and nuclear energy are shown in supplemental figure S1. In panel (j), assets divested reflects total assets under management based on institutional commitments. Sources and additional details about each variable are provided in supplemental file s1.

Figure 3.



Open in new tabDownload slide

Time series of climate-related responses. Data obtained after the publication of Ripple and colleagues (2021) are shown in red (dark gray in print). For area burned (l) and billion-dollar flood frequency (n) in the United States, black horizontal lines show changepoint model estimates, which allow for abrupt shifts (see supplement). For other variables with relatively high variability, local regression trendlines are shown in black. Variables were measured at various frequencies (e.g., annual, monthly, weekly). Labels on the ***x***-axis correspond to midpoints of years. Billion-dollar flood frequency (n) is likely influenced by exposure and vulnerability in addition to climate change. Sources and additional details about each variable are provided in supplemental file S1.

Economics

Encouragingly, there was a strong increase in global fossil fuel divestment in 2022 (figure 2j). Despite an overall decreasing trend, direct fossil fuel subsidies increased to US$440 billion in 2021, which is a worrisome rise from levels below US$200 billion (figure 2o). The percentage of greenhouse gas emissions covered by carbon pricing was relatively flat between 2021 and 2022 (figure 2m), as was the global emissions-weighted average price per tonne of carbon dioxide (approximately US$14.20 as of 2022; figure 2n). Both the proportion of emissions covered and the price of carbon need to increase dramatically to be effective in curbing global fossil fuel use (Cramton et al. 2017).

Energy

Because of the COVID-19 pandemic, global fossil fuel energy consumption decreased in 2020, along with carbon dioxide emissions and per capita carbon dioxide emissions (figure 2h, 2k, 2l). However, these declines were short-lived, and in 2021, all of these variables rose significantly again. Although solar and wind power consumption increased by roughly 18% between 2020 and 2021, it is still approximately 18 times lower than fossil fuel consumption (figure 2h). Despite the urgent need to immediately cease new fossil fuel development and reduce emissions, fossil fuel projects continue to be pursued on an enormous scale. There are currently 425 "carbon bombs"—existing or planned fossil fuel extraction projects with at least 1 gigaton of potential carbon dioxide emissions—and their potential emissions is roughly twice the 1.5-degree Celsius carbon budget (Kühne et al. 2022).

Global mean greenhouse gases and temperature

Three major greenhouse gases—carbon dioxide, methane, and nitrous oxide—all set new year-to-date records for atmospheric concentrations in 2022 (figure 3a–3c). In March of 2022, carbon dioxide concentration reached 418 parts per million, the highest monthly global average concentration ever recorded. In addition, 2022 is on track to be one of the hottest years on record (figure 3d). Ocean heat content rose greatly in 2021 and is now at a record high (figure 3i).

Climate impacts

Disasters associated at least partially to climate change have been steeply trending upward. Climate change has been linked to increases in both the frequency and intensity of extreme heat events. The number of extremely hot days has nearly doubled since 1980 (figure 3o). Globally, roughly 500,000 deaths between 2000 and 2019 were heat related, and the heat-related excess death ratio rose significantly from 2000–2003 to 2016–2019 (Zhao et al. 2021).

The impacts may not track linearly with global heating. As our global temperatures creep up, the frequency or magnitude of some types of climate disasters may actually leap up (Calvin 2019, Fischer et al. 2021). Our preliminary models indicate that this leaping pattern or threshold response may be the case in the United States for both the area burned by wildfires and the number of inland floods that have caused at least US$1 billion dollars in damages (see supplemental file S1, figures 3l, 3n, supplemental figures S2–S3). In addition, global wildfire activity appears to be exhibiting a rapid increase since 2009 (figure 3m). Because of rising temperatures and other factors such as severe windstorms, the propensity of certain mosquito species to transmit the dengue virus has risen substantially since 1980 (figure 3p). Rising temperatures increase the risks of feedback loops and tipping points being triggered, potentially including, for example, permafrost thawing and Amazon forest dieback (see supplemental file S1). Higher temperatures will increase the risk of cascading effects such as disease and conflict, as well as heighten the probability of and our vulnerability to other catastrophic threats (Kemp et al. 2022).

Climate policy

Most planetary boundaries that regulate the state of the Earth are beyond their safe space (Rockström et al. 2009; see the supplemental material). Therefore, climate change is not a stand-alone issue. It is part of a larger systemic problem of ecological overshoot where human demand is exceeding the regenerative capacity of the biosphere (Wackernagel et al. 2002). Humanity cannot sustain unlimited growth in a finite world. We need to address ecological overshoot, while at the same time ramping up climate action. Therefore, we continue our call for holistic and transformative change (e.g., Rees 2019, Ripple et al. 2020). Keys to curbing the ecological overshoot involve greatly reducing overconsumption and waste by the global middle class and especially the wealthy, stabilizing and gradually reducing the human population by providing education and rights for girls and women, and implementing a sustainable ecological economics that ensures social justice (Rees 2019).

The increasing frequency and intensity of climate disasters emphasizes the need for immediate mitigation and adaptation. In addition to protecting nature, including forests, and eliminating nearly all fossil fuel emissions, efforts should be made to explore the potential of effective carbon dioxide removal strategies, which can help cool the planet in the long term by countering historical emissions (supplemental figure S4). A sufficiently high carbon price can reduce emissions in certain sectors and encourage carbon dioxide removal. If designed well, it can also provide funding to support socially just climate adaptations and compensate for climate-related losses and damages, especially in the developing world. To further promote climate justice, this could be accomplished by returning some or all of the carbon price revenue directly to the people, especially in low-income areas that are most vulnerable to climate impacts. More generally, other policy instruments could include investments in innovation and climate finance (supplemental figure S5), positive subsidies, and feed-in tariffs that guarantee an above-market price for renewable energy producers.

A call to action

Recent years have seen an unprecedented trend in scientists speaking out on the climate crisis. We applaud this trend and view it as a natural consequence of scientists being citizens concerned about the preservation of the planet for future generations (Nelson and Vucetich 2009). When backed by sound and transparent scientific arguments, the potential for scientists to educate the public and speak truth to power can be a driving force for the needed policy shifts. Indeed, vocal and articulate scientists played a key role in bringing issues such as nuclear annihilation and ozone depletion to the fore. In this spirit, we implore our fellow scientists to speak out on climate and other environmental issues. In addition to speaking out, some researchers have argued that the situation is so dire that we are at the point where peaceful civil disobedience by scientists is needed (Capstick et al. 2022).

As has been demonstrated by the surge in yearly climate disasters, we are now in a major climate crisis and global catastrophe with far worse in store if we continue with business as usual. As such, there is more at stake today than at any time since the advent of the stable climate system that has supported us for more than 10,000 years. Here we stand at the precipice, with the opportunity to make such an immense difference for life on Earth. Approximately one hundred billion people have lived and died over the 2-million-year history of humans on Earth (Curtin 2007), and there are potentially trillions of human beings who will someday exist whose fate depends on the choices we make today. The very future of humanity depends on the creativity, moral fiber, and perseverance of the 8 billion of us on the planet now. Rather than lose hope, we must equitably reduce ecological overshoot and immediately pursue massive-scale climate change mitigation and adaptation. This is the only way we can limit the near-term damage, preserve nature, avoid untold human suffering, and give future generations the opportunities they deserve.

3.

Net Zero and the role of the aviation industry, Chatham House, November 2023

The historical lack of decarbonization action, combined with the political disdain for constraining demand for high-carbon products and energy services, has led to a growing reliance on the use of technology to remove CO_2 from the atmosphere in the future, commonly termed 'negative emissions'. **This approach embodies very significant risk**. The shift away from straightforward reduction targets, towards combined reductions and removals targets, has galvanized more countries to pledge and legislate for more ambitious climate action. While this should be applauded, societies also need to step back and scrutinize proposed methods of reaching net zero, across all sectors of the economy, inclusive of aviation.

Summary —

The aviation industry contributes around 1 per cent of UK GDP and provides additional unquantifiable benefits, including aiding the expansion of business investment and enabling people to visit family members who live abroad. However, there is a significant risk that by 2030 the global carbon budget – to retain a 67 per cent chance of averting more than 1.5°C of global warming – will be exhausted. The aviation sector remains extremely difficult to decarbonize, with the deployment of supply-side solutions likely to take decades.

Near-term policies to manage demand within the aviation sector could play a role in buying time for the development of supply-side decarbonization solutions, such as advanced next generation aircraft and sustainable aviation fuels. While this approach may be politically challenging, the climate risks associated with surpassing 1.5°C – when tipping points may begin to kick in and lead to runaway climate change – make it vital to examine what level of demand management may be required, and what it may entail.

The focus on demand management in the aviation sector is gaining traction. In December 2022, the European Commission gave France the green light to ban short-haul domestic flights between cities linked by train journeys of less than 2.5 hours. In the UK, the Climate Assembly has shown that the British public supports limits on flying, depending on how technological solutions progress. —

Demand-management policies and technological solutions can work in parallel, as supply-side technologies are commercialized and deployed, demand-management measures could be eased. In October 2022, the UK Committee on Climate Change noted in its progress update that it is considering ways of mitigating the risks of relying on supply-side solutions, 'The Government's plans for aviation focus on sustainable aviation fuel and zero/low-emission aircrafts. These technologies have potential, but there are significant risks in their delivery. In the near term, managing demand would have a much greater benefit for the climate.'

The model developed for this paper explores the role of demand management following analysis of the main emissions abatement mechanisms of the UK government's Jet Zero Strategy high-ambition scenario. The model covers all UK domestic and outbound international flights.

According to this analysis, a prudent risk-minimization approach would be to reduce flying in terms of frequency and distances flown, over the remainder of the 2020s. Under this lower-risk scenario, UK demand in terms of passenger-kilometres flown in 2030 would need to be 36 per cent lower than in 2019 to stay within the sector's fair share of global carbon budgets, with demand returning to 2019 levels by 2050, once supply-side decarbonization has caught up.

In the UK the top fifth of earners fly five times more often than the poorest fifth. It may be possible to achieve a 36 per cent reduction in demand by 2030 if a future demand-management policy shifted behaviour so that most people who currently take more than one return flight per year reduced that number by one return flight and took no more than four. This would leave the 77 per cent of the UK population who currently take no more than one return flight unaffected. This is a moderate level of behaviour change to put the aviation sector on a climate compatible trajectory.

The impact of non-CO_2 effects – such as water vapour emitted at high altitudes as part of an aircraft's contrails – remains uncertain and poses a further threat to already limited carbon budgets. Even the most optimistic interpretation of this uncertainty indicates that if non-CO_2 effects were to be factored in, there would need to be significantly greater reductions in demand.

If near-term action to reduce demand is delayed, but the UK aviation sector is still to stay within its fair share of global carbon budgets, demand in 2050 will need to be around one-quarter lower, relative to 2019. This scenario does not factor in non-CO_2 effects and embodies considerable additional risk. Namely, that a significant proportion of the dwindling carbon budget is used up over the next decade, leaving humanity to rely on uncertain future supply-side decarbonization and even greater demand management in the long term.

4

Comment: Carbon capture and storage is a dangerous distraction. It's time to imagine a world beyond fossil fuels, Catherine Abreu, Reuters, 11 December 2023

The UN climate talks at COP28 could be on the precipice of delivering a global agreement to phase out fossil fuels: an historic breakthrough in this process, which has failed to name the cause of the climate crisis for more than 30 years

In what should come as a surprise to no one paying attention to the climate crisis, lobbyists from the fossil fuel industry have shown up at COP in a record numbers, a whopping 2,400, opens new tab, according to sources, with the intention to delay progress and distract from real climate solutions. One of their biggest tricks? Carbon capture and storage (CCS) technologies.

Fossil fuel executives, opens new tab, a large army of their lobbyists and their political allies are increasingly touting CCS as the silver bullet to curb, or even eliminate, emissions (note the increasing presence of the industry-driven reduction of "emissions", rather than the cause of those emissions: fossil fuels). This provides a tantalizing fix to keep things exactly as they are, locked into a status quo that will continue to make fossil fuel executives richer and the rest of us barreling towards climate catastrophe.

This supposed carbon-canceling panacea, however, is not what the fossil fuel industry would have you, and policymakers, believe.

New research shows, opens new tab that governments have spent over $20 billion to date, and have approved up to $200 billion more, of public money on CCS. This is despite the vast majority of projects failing to get off the ground, opens new tab. Such an expenditure on a technology fraught with uncertainties and risks is a grave misallocation of public resources.

There are currently 42 operational commercial CCS projects across the world with the intended capacity to store 49 million tonnes of carbon dioxide annually. That is only about 0.1%, opens new tab of the world's roughly 37 billion tonnes of annual carbon dioxide emissions.

Delegates walk at the Dubai's Expo City during the United Nations Climate Change Conference (COP28) in Dubai

Delegates walk at Dubai's Expo City during the United Nations Climate Change Conference (COP28) in UAE. A reported 2,400 lobbyists from the fossil fuel industry were at the summit. REUTERS/Thaier Al-Sudani Purchase Licensing Rights, opens new tab

According to the International Energy Agency (IEA), an inconceivable 32 billion tonnes of carbon dioxide , opens new tabwould need to be captured for utilisation or storage by 2050 to limit climate change to 1.5 degrees Celsius. This would require 26,000 terawatt hours of electricity generation to operate in 2050, which exceeds the total global electricity demand, opens new tab of 2022. It would also require over $3.5 trillion in annual investments , opens new tabup to 2050, an amount equal to the entire industry's annual average revenue in recent years. The magnitude of technology deployment and investment required to achieve this is just not feasible.

The IPCC figures are also alarming: its pathways that rely on higher amounts of CCS are ones that have more overshoot past 1.5C, which means more devastating climate impacts and which would take the Earth's climate beyond irreversible tipping points.

Not only are these projects astronomically expensive, they also pose severe risks to the safety of nearby communities and undermine climate progress by supporting expanded fossil fuel extraction. The Institute for Energy Economics and Financial Analysis (IEEFA) estimates that nearly three-quarters of all CO2 captured annually is reinjected into the ground for enhanced oil recovery to push more oil and gas out again.

This misguided reliance on CCS to perpetuate fossil fuel usage underscores the pervasive influence of the fossil fuel lobby on shaping our collective imagination of a climate-resilient future.

In Norway, gas fields Sleipner and Snohvit are often held up by CCS proponents as examples of successful CCS projects that others can strive towards emulating. These projects, however, were riddled with problems, opens new tab and encountered alarming challenges. The Snohvit storage site rejected CO2 unexpectedly, while Sleipner experienced leaks into an unknown geological layer, exposing the inherent risks and uncertainties of underground carbon storage.

Oil and gas company Statoil gas processing and CO2 removal platform Sleipner T is pictured in the offshore near the Stavanger

Norwegian oil and gas company Statoil's gas processing and CO2 removal platform Sleipner T is pictured offshore. REUTERS/Nerijus Adomaitis Purchase Licensing Rights, opens new tab

The scientific viability of long-term CO2 storage remains dubious, with concerns of leaks looming large. The inevitability of leaks renders this technology not just risky but a potential hazard, threatening lives and local environments. As the IEA notes, opens new tab, the "history of CCUS has largely been one of underperformance". The truth is that CCS is an old technology that has existed for 50 years and has never been shown to be fit for purpose. It is a dangerous distraction from the real solutions that we need to undergo: a rapid phase-out of fossil fuels coupled with a rapid phase-in of renewable energy and an increase in energy efficiency measures.

Further, the cost of implementing CCS technology, opens new tab has not decreased at all in the last 40 years, whereas the cost of renewable technologies like solar, wind and batteries have fallen dramatically.

The only things the fossil fuel industry has successfully captured in that time are politicians, and our imaginations.

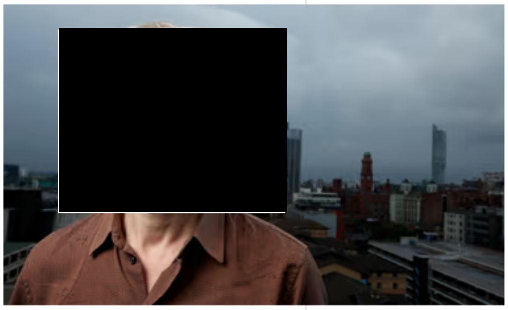
This faith in the promise of CCS as a savior perpetuates the shackles of fossil fuel reliance on our collective vision for a sustainable world. The industry's pervasive influence over politics stifles alternative pathways, trapping us in a loop of dependence on unproven technologies over safer and more just energy solutions.

Authoritative bodies such as the Intergovernmental Panel on Climate Change (IPCC) and the IEA unequivocally assert that emissions from existing fossil fuel infrastructure are propelling us past the critical 1.5C threshold, and our best chance of staying beneath it requires an urgent halt to new fossil fuel production altogether.

We must break free and chart a new course guided by Indigenous leadership, a just transition for workers and a viable fossil fuel phase-out. Over 100 countries at COP28 agree, opens new tab: It's time to imagine a world beyond fossil fuels.

5

Extract from 'Greenwashing or a net zero necessity? Climate scientists on carbon offsetting', The Guardian, 18th January 2023



Prof Kevin Anderson, deputy director of the Tyndall centre for climate change research at the University of Manchester. Photograph: Christopher Thomond/The Guardian

Kevin Anderson, professor of energy and climate change at the University of Manchester, says that offsets are actively dangerous. "My take on offsets, even supposedly good ones, is that from a climate perspective they are worse than doing nothing."

This is partly owing to the "rebound" effect, he says. Essentially, if people think their carbon-emitting activities are covered by offsetting, they have no incentive to really reduce their emissions, and this encourages the continuation and even expansion of high-carbon activities.

Think of flying - if you believe that your flights are carbon-neutral, you will continue to take more of them.

Another issue is the time lag between the emissions and the impact of the offset. Each flight you take is pouring carbon dioxide into the atmosphere, where it will continue to heat the planet, even though the trees you consider to be offsetting your journey are taking up to a century to grow.

For Anderson, there are also equity issues - offsets are often used to cover for high-carbon activities in richer nations, without really benefiting the poor countries they are often bought from.

Anderson says: "The timeframe for cutting CO_2 associated with "pursuing ... 1.5C" and "well below 2C" [the requirements of the Paris agreement] is now so tight that there is no emissions space for companies to use offsetting as a means of further locking in high-carbon activities, technologies, norms and practices, even under the heroic assumption that offsetting actually works. Put simply, we need to pull every mitigation level to its max level; there is no longer any give or flexibility in the system."

He adds: "Trees, and temporary CO_2 sequestration, are not an offset for an essentially permanent transfer of carbon from the lithosphere into the atmosphere."

6

Net Zero and the role of the aviation industry, Chatham House, November 2023

SAFs are likely to develop based on bioenergy feedstocks. Depending on the bioenergy feedstock choice and supply chain properties, SAFs can have reduced life cycle GHG emissions. Most of the controversy and debate around the long-term viability and sustainability of SAFs centres around these supply chain choices. If the feedstocks used to produce SAFs derive from food crop production wastes or municipal waste, many of the potential downsides and controversies of SAFs are minimized or eliminated. However, there is growing concern that aviation is just one of many sectors increasingly reliant on bioenergy-based decarbonization, and that as the scale of reliance grows the risks of future poor supply chain choices increases. The two principal concerns are that land tensions with food production could lead to increased staple crop prices, especially impacting vulnerable populations, and that supply chain emissions – inclusive of land-use change emissions – undermine the abatement potential of SAFs.

Regarding food prices and land tensions, land is a limited resource, with much of the highly productive land already used for food production. It should be noted that many of the integrated assessment models (IAMs) that the IPCC and researchers rely upon to model whole-economy decarbonization pathways do not contain detailed and robust land-use modelling, and as such future land tensions with food production remain uncertain.

Supply chain emissions of SAFs are impacted by direct and indirect land-use change when bio-crops are initially planted, the use of fertilizers and pesticides, the change in soil carbon due to the health of the ecosystem being impacted by a monoculture of bio-crops, and the use of fossil fuels in the cultivation, harvesting, processing and transport of the bio-crop. While it is theoretically possible to significantly minimize supply chain emissions, at the scale of individual farms the supply chain decisions are primarily driven by cost considerations, meaning the theoretical potential often hugely differs to the realities on the ground.

The emissions abatement potential of SAFs assumed in the JZS is in the range of 67–75 per cent emissions savings relative to kerosene.43 And the high-ambition scenario projects around 5 million tonnes of SAF being required by 2050.44 This volume of SAFs is equivalent to around 40 per cent of the UKs pre-pandemic jet fuel consumption.

Determining the land area that this target may require is complex and depends on the type of land the bio-crops are grown on, the associated yield of that land, the process to convert the biomass into SAFs, the composition of the portfolio of feedstocks, and the proportion of wastes and residues utilized. However, an illustrative example is to assume all the biomass comes from miscanthus, which would require between 13–22 per cent of all UK agricultural land, based on the methodology of the Royal Society (2023).

There are two model options to forecast the scale-up trajectory of SAFs. The first is based on the industry led Sustainable Fuels UK Road-Map report,46 which is likely to be on the optimistic end of scale-up trajectories. This roadmap indicates that if the global aviation sector were to rely on SAFs to the same scale as the UK, 140–180 Mt of SAFs per year would be required by 2050. Given supply chains are likely to be global in nature and the UK will likely source various SAFs from global markets, it is assumed that the available supply of SAFs to the UK market is proportional to the UK's share of global jet fuel consumption, namely 3.6 per cent, where the lower bound is achieved by 2050. Hence, in the first SAF supply option in the model around 5.1 Mt is available to the UK aviation sector by 2050, a similar value to that assumed within the JZS high-ambition scenario.

While land availability could be a significant limitation to this global scale of SAFs, it is perhaps the rate of production ramp-up required that is more likely to limit supply in the near term. In 2020, global production of SAFs was around 0.1 Mt/yr,47 meaning that out to 2050 supply would need to increase 1,400-fold to meet the global target of 140 Mt/yr, or at a compound annual growth rate (CAGR) of just less than 30 per cent per year. This rate of scale-up clearly embodies significant reliance risk. The modelling here assumes an s-curve scale-up trajectory (rather than a linear scale up), shown in Figure 10. The s-curve reaches its asymptotic value in 2050, the time horizon of net zero.

It should be noted that many other sectors, beyond aviation, are currently looking to bioenergy, including bio-crop feedstocks, within their decarbonization pathways, such as biofuels for road transport, biomass-based domestic heating and biomass feedstocks for BECCS. And as the IPCC working group 3 (WGIII) report recently stated, 'the potential to scale up bio-based SAF volumes is severely restricted by the lack of low cost and sustainable feedstock options'.48 In an open letter to the secretary of state for transport in 2019, the CCC states, 'Our scenario has a 10% uptake of sustainable fuels in 2050. It is not appropriate to plan for higher levels of uptake at this stage, given the range of competing potential uses for biomass across the economy and uncertainty over which use will be most cost-effective.'49

The second option the model considers is that SAFs account for 10 per cent of jet fuel supply as assumed under the continuation of the current trends scenario of the JZS.50 This second option can be thought of as a scenario in which reliance on bioenergy is reduced as supply may be limited due to competition between sectors for bioenergy production, as a means of limiting land tensions with food production, and more broadly as a means of minimizing reliance risks. It should be noted that the nature of this assumption means the 2050 supply varies depending on future demand (PAX-km). For instance, if demand increases by 70 per cent SAF supply in 2050 is around 2.2 Mt per year. However, if demand falls by 30 per cent, SAF supply in 2050 is around 0.9 Mt per year.

7.

Net Zero Aviation Fuels Policy Briefing, Royal Society, February 2023

Conclusion

All alternative fuel options have unique opportunities and limitations as illustrated in figure 17. It is evident that there is no single simple answer to decarbonising aviation and the solution is likely to be a portfolio. In the longer term, more disruptive solutions may be advocated but this will depend on the availability of new engines and airframes. Despite best endeavours at developing and rolling out alternative fuels, a scenario may arise where the reliance is predominantly on hydrocarbon fuels if the alternatives can't be manufactured and safely deployed at the scale needed.

6.1 Feedstock availability

Feedstock availability and accessibility is an international challenge and not unique to the UK. Industry should exercise caution when choosing one solution over another as alternative fuel solutions will need to be accepted globally. The pathways to decarbonisation are different in different parts of the world and there is a need to encourage the best solution for each region / place rather than a one solution fits all, noting that long distance travel will require compatible solutions at each end.

Bio-based routes exhibit significant resourcing implications particularly energy crops which would require at least half of all UK agricultural land for their cultivation to supply the whole amount of jet fuel used in the UK. This would incur significant trade-offs with food production, increasing the risk of carbon leakage as domestic agricultural produce is substituted with imports, as well as having potentially negative environmental consequences through soil erosion and pollution. There is also much debate around what feedstocks constitute waste as well as the effects of competition from other industries. For example, forestry, agricultural and sawmill residues use in aviation fuel production may lead to unwanted ecological problems such as soil nutrient depletion leading to increased use of fertilisers and thus increasing greenhouse gas emissions.

It is important to consider that waste is different in different regions, and its availability varies across regions and countries. Increased recycling will lead to less waste and availability of waste will thus be more restricted in the future. Standardisation of very many different waste to fuel pathways may pose a significant challenge in the future and Fuel Standards will need to be debated and negotiated.

The energy source for hydrogen, ammonia and efuels must be renewable electricity if the final product is to be considered net zero CO_2. Accessing the required amount of electricity will be a challenge, particularly as other energy uses will also require large amounts of renewable electricity. The production of ammonia and efuels require more energy than hydrogen however this is partly offset by reductions in the energy needed to store these fuels.

8.

Progress Report to Parliament 2023; Recommendations to Government, Climate Change Committee June 2023

No airport expansions should proceed until a UK-wide capacity management framework is in place to annually assess and, if required, control sector GHG emissions and non-CO2 effects. A framework should be developed by DfT in cooperation with the Welsh, Scottish and Northern Irish Governments over the next 12 months and should be operational by the end of 2024. After a framework is developed, there should be no net airport expansion unless the carbon-intensity of aviation is outperforming the Government's emissions reduction pathway and can accommodate the additional demand.

9

'Aviation is a Health Issue', Stay Grounded, February 2024

Flying poses a long-term risk for the climate and a livable future. It also is an immediate health risk for people living near airports and under flight paths, as well as for cabin crew and passengers.[A] This paper summarises the current science on health effects associated with noise and air pollution and explores ways to tackle them.

THE MOST IMPORTANT FACTS AT A GLIMPSE:

- Flying, while often depicted as a care-free and convenient mode of transport, is actually detrimental to human health. While this is especially true for those flying frequently like cabin crew, pilots and frequent business travellers, people who do not fly also bear the consequences.
- Aircraft noise can lead to wide-ranging health issues. In particular, residents in the vicinity of airports are negatively impacted by take-offs and landings during the night. Curfews exist at some airports and should be expanded.
- The burning of aircraft fuel releases pollutants that cause thousands of premature deaths. A major problem is ultrafine particles, which penetrate deep into the lungs and even enter the bloodstream. Good measuring and strict air regulations for areas surrounding airports must be implemented.
- Aircraft noise, emissions and the related health issues fall disproportionately on low-income communities and airport workers, often including a significant number of people of colour and marginalised populations.
- While technological advancements can help reduce some noise and pollutants, these reductions are eaten up by the increase in yearly flight numbers. Some noise and pollution mitigation options may inflict slight raises in carbon emissions.
- **Reducing the number of flights and stopping airport expansion are the best solutions to counter both health issues and climate breakdown. Residents, health organisations, the climate movement and workers can build powerful coalitions to achieve a fair reduction of aviation, and a healthier future for all.**

[A] While this paper focuses on impacts of flying on humans, we acknowledge its impacts on other living beings and entire ecosystems. The construction and operation of airports and associated projects lead to numerous social and health impacts like the loss of agricultural land, water use, and effects on the social structures of communities.

10

Public to foot £62bn bill for climate damage from airport expansions: Aviation industry will only pay for 16% of the emissions clean-up costs of UK airport expansions, New Economics Foundation, 27 January 2022

In allowing airports around the country to expand, the government is letting the aviation industry off the hook for £62bn of damage to the climate, analysis out today from the New Economics Foundation (NEF) finds. The analysis calculates that the aviation industry will only pay for 16% of the emissions clean-up costs of the eight airport expansions currently moving through UK planning processes.

The analysis finds that new government guidance issued in September has more than doubled the climate cost of the eight airport expansions. This is due to the expansion plans being developed based on out-of-date estimates of the cost of the climate crisis. The analysis shows that key expansion decisions have been made based on underestimated costs to the climate and society.

In September, the government updated its 'carbon values' – the cost of cleaning up each tonne of emissions released into the atmosphere – to reflect its latest net-zero emissions target. As a result, short-term carbon values have more than tripled, meaning that the clean-up costs associated with infrastructure projects are much higher than previously assumed. The government does not have a comprehensive mechanism for recouping these costs from the aviation industry. The analysis finds that the main emissions taxation policy, the UK Emissions Trading Scheme (UK ETS) is full of industry loopholes and does not take into account the government's updated carbon values, meaning that the aviation industry will only pay for 16% of the clean-up costs of airport expansions. The remaining bulk of the clean-up cost will fall to wider society and the taxpayer.

There are eight airport expansion projects which are active in legal planning procedures, ranging from projects in early consultation phases, like Gatwick airport, to projects which have been approved, but are subject to legal challenges, like Southampton airport. Previous NEF analysis showed that the climate impact of proposed regional airport expansions will be up to eight times worse than previously claimed, as airports have not been presenting the full climate cost of their schemes. The new analysis finds that all eight airports have had their climate costs underestimated even further.

Heathrow, the UK's largest airport, is planning a new runway capable of increasing passenger departures by 40m a year. As a result of updated government carbon values, the cost of emissions from Heathrow's proposed expansion from 2025 to 2050 has doubled, from around £50bn to over £100bn.

As a result of the change in carbon values, and taking just departing flights into account, the analysis finds that:

- The clean-up cost of emissions from the Heathrow airport expansion cost has doubled to £49.2bn, of which only 15% will be paid for by the aviation industry.
- The Gatwick airport expansion emissions cost has doubled to £9.1bn, of which only 7% will be paid for by the aviation industry.
- The Luton airport expansion emissions cost has doubled to £5.2bn, of which only 26% will be paid for by the aviation industry.
- Manston airport expansion emissions cost has more than doubled to £5.1bn, of which only 25% will be paid for by the aviation industry.
- Stansted airport expansion emissions cost has more than doubled to £2.4bn, of which only 23% will be paid for by the aviation industry.

- Southampton airport expansion emissions cost has more than doubled to £954m, of which only 22% will be paid by the aviation industry.
- Leeds Bradford airport expansion emissions cost has more than doubled to £913m, of which only 24% will be paid for by the aviation industry.
- Bristol airport expansion emissions cost has more than doubled to £645m, of which only 23% will be paid for by the aviation industry.

Alex Chapman, researcher at the New Economics Foundation, said:

"More than two years on from adopting our 2050 net-zero target, the government has finally updated its estimates of how much it will cost to clean up greenhouse gas emissions from any new infrastructure projects. The huge increase means that decisions have been made, including on eight proposed airport expansions, on the basis of grossly underestimated costs to the climate and our society.

Only 16% of the £74bn tab for cleaning up the emissions from these expansions will be covered by the aviation sector. The rest will be picked up by wider society and the taxpayer. In essence, a colossal subsidy is being passed to polluting big business, and a debt passed on to future generations. As the majority of aviation emissions are made by a small number of wealthy frequent flyers, this is the opposite of 'levelling-up'.

In light of this new evidence all active UK airport expansions should immediately be paused, and re-evaluated in line with the new guidance. In addition, loopholes in current carbon taxes should be closed, and a Frequent Flyer Levy introduced to make sure the costs of cutting carbon emissions are passed on to the biggest polluters and the wealthiest in our society."

11

THE JET ZERO STRATEGY IS AN ABDICATION OF RESPONSIBILITY TO THE PLANET AND FUTURE GENERATIONS

Drawing a downward slanting line on a piece of paper and crossing your fingers is not a 'strategy', Alex Chapman, New Economics Foundation, 28 July 2022

When is a strategy not a strategy? We found out the answer earlier this week when the High Court upheld an NGO challenge to the government's Net Zero Strategy. The plan was supposed to set the path to cutting our carbon emissions to net zero by 2050. But, as a brutal heatwave buckled railway lines and caused fires in London, the judge has sent the government back to have another go, citing the strategy's failure to set out the policies needed to hit our emissions reduction targets. But if the Net Zero Strategy was flawed, yesterday's 'Jet Zero' strategy for the future of the aviation sector is something worse.

- Despite temperatures reaching levels never before seen in the UK, the day started as many others have in recent times, with a government press release laden with misinformation. The headline claim was: "2019 set to be remembered as the peak year for aviation emissions". But the Jet Zero strategy doesn't actually say this. It sets a target for carbon (CO2) emissions to peak in 2019, but ignores non-carbon gases like water vapour or aerosols, even though in their own words, their "net warming rate is likely to be around three times that of CO2". These non-carbon gases really matter when you consider that underpinning the strategy is a forecast that the UK will see 720,000 (+33%) more aircraft journeys a year by 2050.
- A more accurate headline might have been: 'government sanctions unlimited air travel growth and 2.5bn tonnes of emissions'. Between 2023 and 2050 the government forecast that the aviation sector will pump out some 837 million tonnes of CO2. When we apply the final step, unforgivably missed by government, and take non-CO2 emissions into account, this rises to a best estimate of 2.5 billion tonnes of CO2e equivalent emissions. In 2035, when the overall economy's emissions are legally supposed to be down 78%, aviation emissions will be up 50%. In 2050, when the wider economy should be emitting net zero emissions, aviation will be pumping out the same volume of emissions as it did in 1990. To fit this square peg in a round climate hole, the government plays its 'get out of jail free' card: "this scenario results in 19.3 MtCO2e [sic] of residual emissions in 2050 to be offset or removed".
- "A more accurate headline might have been:'government sanctions unlimited air travel growth and 2.5bn tonnes of emissions'."
- So there you have it. Jet Zero pulls of the impressive feat of containing 62 'policy commitments' yet none which will actually ensure the decarbonisation of the sector. Instead, government gambles on being able to capture and store 20 – 30 million tonnes of carbon per year by 2030. As it stands, the world's largest carbon capture plant has been having major trouble capturing just 0.02% of this amount. To believe that we'll scale this up by a factor of 6,250 in just eight years seems like an incredibly risky, expensive, and unnecessary gamble with our safety and our futures. Not only that, but if we are serious about preventing the deadly heatwaves, summer wildfires or flooded homes which will result from climate breakdown, government will also need to do something about the non-CO2 gases.
- At its core, the Jet Zero strategy represents an abdication of responsibility. The events of the past few days show us that we need serious action to eliminate dangerous fossil fuels as soon as possible. The government's plans are paltry. The much trumpeted 'sustainable aviation fuel' (SAF) mandate — that 10% of planes' fuel mix should be sustainable by 2030 — is anything but. The latest research suggests that SAFs currently have an environmental impact almost as bad as traditional fossil fuels. Even in the government's optimistic modelling the modest shift to SAF has minimal impact: the government still expects the aviation sector to be producing more carbon emissions in 2030 than it did in 2016.

- Missing from Jet Zero is a simple, and relatively painless control on emissions. All government need do is make any further expansion of air travel conditional on tangible emissions reductions delivered. This control should be set against a sector emissions trajectory which puts safety first, applying the 'precautionary principle' mandated in the recent Environmental Principles Policy Statement. This means tightening emissions faster in the short-term when the availability of techno-solutions is lowest and risk is highest. With the industry publicly projecting great confidence in its ability to scale-up emission cutting technologies, they would presumably be relaxed about government holding them to account in this way.
- There are already policies which would cut emissions in the next few years — and those policies are very popular with the public. A significant majority back a frequent flyer levy, which charges higher ticket prices for those who fly often. The public also support the need to limit airport expansion to reduce aviation's impact on the climate. Given that business air travel was already stagnant before the pandemic forced us to get comfortable with video calls, there is clearly limited business demand for expansion of air travel outside of the aviation industry itself.
- Drawing a downward slanting line on a piece of paper and crossing your fingers is not a 'strategy'. The heatwave damage we've seen this week shows us what it really is, a deeply dangerous and irresponsible act of unnecessary self-harm.

When is a strategy not a strategy? We found out the answer earlier this week when the High Court upheld an NGO challenge to the government's Net Zero Strategy. The plan was supposed to set the path to cutting our carbon emissions to net zero by 2050. But, as a brutal heatwave buckled railway lines and caused fires in London, the judge has sent the government back to have another go, citing the strategy's failure to set out the policies needed to hit our emissions reduction targets. But if the Net Zero Strategy was flawed, yesterday's 'Jet Zero' strategy for the future of the aviation sector is something worse.

Despite temperatures reaching levels never before seen in the UK, the day started as many others have in recent times, with a government press release laden with misinformation. The headline claim was: "2019 set to be remembered as the peak year for aviation emissions". But the Jet Zero strategy doesn't actually say this. It sets a target for *carbon* (CO2) emissions to peak in 2019, but ignores *non-carbon* gases like water vapour or aerosols, even though in their own words, their "net warming rate is likely to be around three times that of CO2". These non-carbon gases really matter when you consider that underpinning the strategy is a forecast that the UK will see 720,000 (+33%) more aircraft journeys a year by 2050.

A more accurate headline might have been: 'government sanctions unlimited air travel growth and 2.5bn tonnes of emissions'. Between 2023 and 2050 the government forecast that the aviation sector will pump out some 837 million tonnes of CO2. When we apply the final step, unforgivably missed by government, and take non-CO2 emissions into account, this rises to a best estimate of 2.5 billion tonnes of CO2e equivalent emissions. In 2035, when the overall economy's emissions are legally supposed to be down 78%, aviation emissions will be up 50%. In 2050, when the wider economy should be emitting net zero emissions, aviation will be pumping out the same volume of emissions as it did in 1990. To fit this square peg in a round climate hole, the government plays its 'get out of jail free' card: "this scenario results in 19.3 MtCO2e [sic] of residual emissions in 2050 to be offset or removed".

"A more accurate headline might have been:'government sanctions unlimited air travel growth and 2.5bn tonnes of emissions'."

So there you have it. Jet Zero pulls of the impressive feat of containing 62 'policy commitments' yet none which will actually ensure the decarbonisation of the sector. Instead, government gambles on being able to capture and store 20 – 30 million tonnes of carbon per year by 2030. As it stands, the world's largest carbon capture plant has been having major trouble capturing just 0.02% of this amount. To believe that we'll scale this up by a factor of 6,250 in just eight years seems like an incredibly risky, expensive, and unnecessary gamble with our safety and our futures. Not only that, but if we are serious about preventing the deadly heatwaves, summer wildfires or flooded homes which will result from climate breakdown, government will also need to do something about the non-CO2 gases.

At its core, the Jet Zero strategy represents an abdication of responsibility. The events of the past few days show us that we need serious action to eliminate dangerous fossil fuels as soon as possible. The government's plans are paltry. The much trumpeted 'sustainable aviation fuel' (SAF) mandate — that 10% of planes' fuel mix should be sustainable by 2030 — is anything but. The latest research suggests that SAFs currently have an environmental impact almost as bad as traditional fossil fuels. Even in the government's optimistic modelling the modest shift to SAF has minimal impact: the government still expects the aviation sector to be producing more carbon emissions in 2030 than it did in 2016.

Missing from Jet Zero is a simple, and relatively painless control on emissions. All government need do is make any further expansion of air travel conditional on tangible emissions reductions delivered. This control should be set against a sector emissions trajectory which puts safety first, applying the 'precautionary principle' mandated in the recent Environmental Principles Policy Statement. This means tightening emissions faster in the short-term when the availability of techno-solutions is lowest and risk is highest. With the industry publicly projecting great confidence in its ability to scale-up emission cutting technologies, they would presumably be relaxed about government holding them to account in this way.

There are already policies which would cut emissions in the next few years — and those policies are very popular with the public. A significant majority back a frequent flyer levy, which charges higher ticket prices for those who fly often. The public also support the need to limit airport expansion to reduce aviation's impact on the climate. Given that business air travel was already stagnant before the pandemic forced us to get comfortable with video calls, there is clearly limited business demand for expansion of air travel outside of the aviation industry itself.

Drawing a downward slanting line on a piece of paper and crossing your fingers is not a 'strategy'. The heatwave damage we've seen this week shows us what it really is, a deeply dangerous and irresponsible act of unnecessary self-harm.

12.

,**'Net Zero and the UK Aviation Sector'**, House of Commons Environment Audit Committee December 2023

Advice from the Climate Change Committee

188. The Climate Change Committee has advised that "demand management is the most effective way of reducing aviation CO2 and non-CO2 emissions", and has pointed to the options available to Government to manage demand, including promotion of the use of digital technologies, addressing current use of private flying and provision of lower-cost domestic rail travel.155

189. In its 'balanced pathway' the CCC envisaged aviation passenger growth by 2037 to be limited to 25% over the level recorded in 2018. Its baseline scenario reflected an assumption of unconstrained growth of around 65% over the same period.156 Chris Stark, the CCC's chief executive, told us in July 2023 that the Government now expected a 70% growth in passenger numbers by 2050, which was beyond what the CCC had modelled: [w]e will have an aviation sector that is too big for the remaining carbon budget that we have in the future if we do not act on the demand side now. We would like to see technology, in similar terms, come through and save the day on aviation, but until it shows signs of doing so, we think it is important to bear down on the growth in demand. We are not suggesting that demand should shrink; we are saying that it should grow by less than the Department and the industry expect it to.