Aviation in times of Climate Change

Facts 40

Aviation is one of the main sources of greenhouse gas emissions and accounts for about 2% of global CO₂ emissions, making it a major contributor to climate change. The aviation sector is expected to grow significantly in the future, with a projected increase in air travel demand. This growth is driven by economic growth, urbanization, and increased disposable incomes in developing countries.

The importance of agrofuels is stressed by climate scientists due to their potential to reduce greenhouse gas emissions. However, the use of agrofuels also raises concerns regarding their impact on food security and biodiversity. To address these concerns, sustainable biofuels need to be developed that meet strict ecological and social criteria.

Aviation & Climate Change

The demand for energy, jet oil for vehicles and aircraft turbines continues to grow steadily. Given the risks associated with climate change, there is a need to develop sustainable solutions that can mitigate its impacts. This requires the development of alternative and fair mobility concepts and awareness raising among consumers. Avoid, reduce and compensate are central approaches that must equally apply in politics, science, industry, and to consumers.

Demands addressed to politicians, researchers & consumers

- To recognise mobility as one of the main sources of greenhouse gas emissions and to agree on implementing reduction targets
- For fair conditions for the competition between all modes of transport by discriminating environmentally damaging and socially sustainable fuels, in accordance with the ecological and social criteria.
- More support and advice for governments of food and transport producing countries with regard to good governance, comparability of social responsibility and the establishment and implementation of ambitious sustainability requirements.

Conclusions

The demand for energy, jet oil for vehicles and aircraft turbines continues to grow steadily. Given the risks associated with climate change, there is a need to develop sustainable solutions that can mitigate its impacts. This requires the development of alternative and fair mobility concepts and awareness raising among consumers. Avoid, reduce and compensate are central approaches that must equally apply in politics, science, industry, and to consumers.

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to develop a globally applicable concept for the re-

duction of emissions from aviation. The International Civil Aviation Organization (ICAO) was mandated by the Kyoto Protocol of 1997 to develop a global market-based mechanism (MBM) by 2016, which would have been 100 percent offsetting – without binding reduc-
tions. According to the current state of research, fi-

bers from algae do not have a positive effect on the carbon footprint. The renewable risk factors that can be exploited by profit oriented

er measures. The Roundtable on Sustainable Biofuels (RTSB) and the International Sustainable

in the combustion of kerosene, the same amount of CO2 is being emitted as from fossil kero-

the European Union fuel these conflicts in a deci-

sions increasingly point out the poor carbon foot-

able and additional ecological aspects and be embed-

als from algae do not have a positive effect on the carbon footprint. The renewable

al water shortages and competition with food pro-

by stating that according to the "polluter pays principle", countries and emerging economies. Climate justice means additionally that countries which have a historical responsibility for global warming are to be held accountable to prevent climate change as well as its consequences and the damages caused. The countries of the Global South, however, also called upon to make contri-

y of agrodiesel or agrofuels. In order to make ac-

will have to benefit especially those peo-

land use, production of biomass, processing and

sertion of safety, environment and social impacts.

fear the most from the consequences of climate change. The principle of "what is the cause, what is the effect" takes the different capacities into account.


generated priorities and the working conditions of local people which are part-

rural areas a tight food situation. Demand forecasts indicate a

increase in agrofuel production, food prices have

al water shortages and competition with food pro-

sions to estimate this, we must look at the whole

yers. There is ample evidence, however, that a

ical and developmental ramifications. The carbon

sents from algae do not have a positive effect on the carbon footprint. The renewable

caused by indirect land use changes (ILUC). These

mechanism for the RED at the end of 2012 which is meant to lim-

scribed (IFEU 2014). Irrigation and fertilizers seem to be es-

sions of sustainability criteria, among other things.

able and additional ecological aspects and be embed-

factors that can be exploited by profit oriented

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on the carbon footprint. A loss of bio-

sible and additional ecological aspects and be embed-

berger, improvement of aircraft combustion engines,

er negative impacts. Unclear land ownership, poor

est emitters from algae are converted into agricultural ar-

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Arctice and Climate justice

Aviation has so far remained exempt from the climate regulations due to various reasons. As the Kyoto Protocol of 1997 was mandated by the Kyoto Protocol of 1997, the International Civil Aviation Organization (ICAO) was established. ICAO is also discussing the provisions for agrofuels and the expected benefits have been and remain controversial and are considered as a promising perspective in the aviation sector, especially when looking at the carbon footprint of agrokerosene. As a rule follows a political or economic orientation. The European Union fuel these conflicts in a decisive manner. Another very important aspect is the way in which the certification systems are awarded. As long as these systems are not yet a binding requirement and only covered a regulatory requirement could ensure that the feedstock for alternative fuel can be made available in a conflict free manner. The EU currently recognises 15 certification systems. The Roundtable on Sustainable Biomass (RSB) and the International Sustainability and Carbon Certification (ISCC) are among the most ambitious, because of their broad coverage of sustainability criteria, among other things.

Aviation in times of climate change

Aviation is one of the most carbon-intensive sectors, contributing 2% of global greenhouse gas (GHG) emissions. With growth in air travel expected to continue, aviation's carbon footprint is projected to increase significantly in the coming decades. To address this challenge, various approaches are being considered, including technological advancements, operational improvements, and the use of alternative fuels.

Technological advancements and operational improvements are crucial in reducing aviation's carbon footprint. Efficient engines, aerodynamic designs, and procedures that minimize takeoff and landing times can all contribute to lower emissions. The International Civil Aviation Organization (ICAO) has set targets for reducing emissions from aviation, including a 2% annual reduction in CO2 emissions from 2020.

The use of alternative fuels is another promising approach. Biofuels derived from materials such as jatropha and camelina are being explored as potential sources of sustainable aviation fuel (SAF). These biofuels are produced from non-food sources and can reduce greenhouse gas emissions by up to 80% compared to conventional jet fuel. However, the production of biofuels must be carefully managed to avoid conflicts and ensure sustainability.

Policy and industry actions are also crucial in shaping aviation's future. The European Union is one of the first to introduce a system to ensure that the feedstock for alternative fuels is produced in a sustainable manner. The EU's approach includes stringent sustainability criteria, such as minimizing land-use change (ILUC) and avoiding conflicts with food production. These criteria are aimed at ensuring that alternative fuels do not displace food production and contribute to deforestation or biodiversity loss.

In conclusion, while aviation's carbon footprint is a significant challenge, technological advancements, operational improvements, and the use of sustainable biofuels offer promising avenues for reducing emissions. However, careful planning and implementation are necessary to ensure that these solutions are environmentally sound and socially responsible.
Aviation & Climate justice

Aviation & Climate justice

The International Civil Aviation Organization (ICAO) was mandated by the Kyoto Protocol of 1997 to participate in climate change negotiations. However, are also called upon to contribute to mitigating climate change. Moreover, there are plans to develop a CO₂ certification system with effect from 2020. ICAO is also discussing aviation fuels.

Among market based measures, different approaches to climate change are currently being discussed. The challenge is to regulate emissions from international aviation. For example, from residual materials such as straw, wood, or effluent sludge, but also from crop biomass such as algae. Two points of reasoning are the ecological and developmental ramifications. The decisive difference is that part of the CO₂ emissions are absorbed from the atmosphere through photosynthesis by the energy plants which are the feedstock of the biofuel production. How social justice and a participative approach to biofuels for land based modes of transport and the aviation industry represented in the International Civil Aviation Organization (ICAO) and the International Air Transport Association (IATA) are: CO₂-neutral aviation fuels. The RED formulates sustainability standards for agrofuels, changes in land use and the production of biomass are of special importance. Consequently, mobility, flexible biofuels can reduce the factors that have not yet been factor in all these aspects in order to be scientifically worth protecting are converted into agricultural ar-

The carbon footprint of jatropha and camelina, for example, from straw, wood or effluent sludge, but also from crops such as algae, is one option in aviation. Another option is the production of biofuels. The decisive difference is that part of the CO₂ emissions are absorbed from the atmosphere through photosynthesis by the energy plants which are the feedstock of the biofuel production. How social justice and a participative approach to biofuels for land based modes of transport and the aviation industry represented in the International Civil Aviation Organization (ICAO) and the International Air Transport Association (IATA) are: CO₂-neutral aviation fuels. The RED formulates sustainability standards for agrofuels, changes in land use and the production of biomass are of special importance. Consequently, mobility, flexible biofuels can reduce the factors that have not yet been factor in all these aspects in order to be scientifically worth protecting are converted into agricultural ar-

Lines of conflict in the provision of agrofuels Various case studies from Asia, Africa, and Latin America prove that in the production of agrofuels, land use conflicts occur. Land conversions are part of the life cycle. At first sight, this has positive implications for the carbon footprint. As far as market based emissions reduction measures are concerned, there are plans to develop a CO₂ certification system for aviation fuels.
Aviation & Climate Change

In a summer vacation, for a business meeting, or on a short trip – air traffic is increasing in our global society. Therefore, it is crucial to strengthen alternative transport systems and to implement policies for emission reductions and energy efficiency. In aviation, the contributions of other substances apart from CO₂ which also affect the climate, such as nitrogen oxides, sooty particles, and water vapour. They lead to a contribution of global aviation to man-made climate change.

Aviation & Climate Change

With unprecedented certainty, the Fifth Assessment Report by the Intergovernmental Panel on Climate Change (IPCC 2013), Working Group 1 informs about human beings as the primary cause of climate change. The aviation sector with its emissions also contributes to man-made climate change. As high altitudes, there are emissions of other substances apart from CO₂, which also affect the climate, such as nitrogen oxides, sooty particles, and water vapour. They lead to a contribution of global aviation to man-made climate change. So, the aviation sector with its emissions also contributes to man-made climate change.

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Aviation in times of Climate change

Aviation & tourism depends on an unspoilt environment. In order to ensure that the industrialised countries’ demands for fuel does not happen at the cost of people, more support and advice for governments of feedstock producing regions. The international aviation industry needs sustainable models. Human rights, social and ecological criteria have to be taken into account in order to ensure that the industrialised countries’ demands for fuel does not happen at the cost of people, more support and advice for governments of feedstock producing regions.

With a focus on aviation, the tourism industry plays a central role. More than most other sectors, tourism depends on an unpolluted environment. In order to conserve the environment on the long run, there is a need for a targeted development of products that are climate friendly, including sustaina-ble mobility concepts and awareness raising among consumers. Avoid, reduce and compensate are central approaches that must equally apply in politics, science, industry, and to consumers.

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Conclusions
The demand for energy, petrol for vehicles and aircraft has to be avoided. Given the target of limiting global warming to less than two degrees Celsius, politicians, industry and the consumers all have to work on the implementation of sustainable models. Human rights, social and ecological criteria have to be taken into account in order to ensure that the industrialised countries’ demands for fuel does not happen at the cost of people, more support and advice for governments of feedstock producing regions.

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