



Net Zero Aviation

Equity, justice and public perception

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Background

Aviation sector accounts for 2-2.5% of CO₂ emissions from fossil sources and land use.

Demand for aviation is projected to grow considerably upto 2030.

The aviation sector is considered “hard to decarbonize” but needing to decarbonize non-the-less.

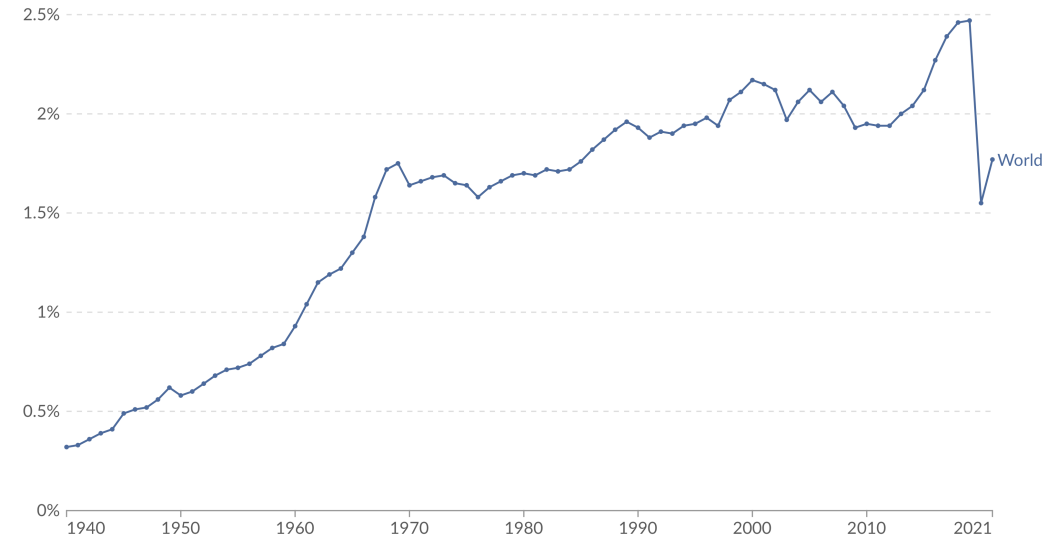
As of 2018 (before the pandemic), only 2-4% of the global population flew internationally.

- Meaning that 1% of the world population emitted 50% of CO₂ from commercial aviation
- This raises urgent need to identify ways to decarbonize equitably.

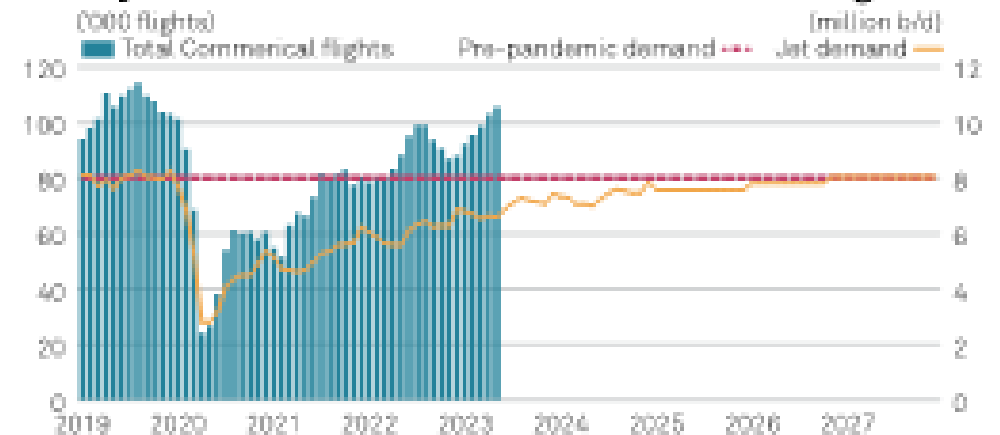
Aviation's share of global CO₂ emissions, 1940 to 2021

Given as a share of carbon dioxide emissions from fossil fuels and land use change.

Our World
in Data



Global jet fuel demand outlook vs commercial flights



<https://www.shell.com/business-customers/aviation/aviation-fuel/civil-jet-fuel-grades.html#:~:text=Jet%20B,by%20domestic%20and%20international%20airlines.>

<https://www.spglobal.com/commodity-insights/en/news-research/latest-news/crude-oil/051923-global-jet-fuel-recovery-lags-air-travel-as-flights-return-to-pre-pandemic-levels>

<https://ourworldindata.org/global-aviation-emissions#:~:text=Aviation%20accounts%20for%202.5%25%20of,to%20global%20warming%20to%20date.&text=Flying%20is%20one%20of%20the,How%20does%20this%20add%20up%3F>



Stakeholder collaboration is required

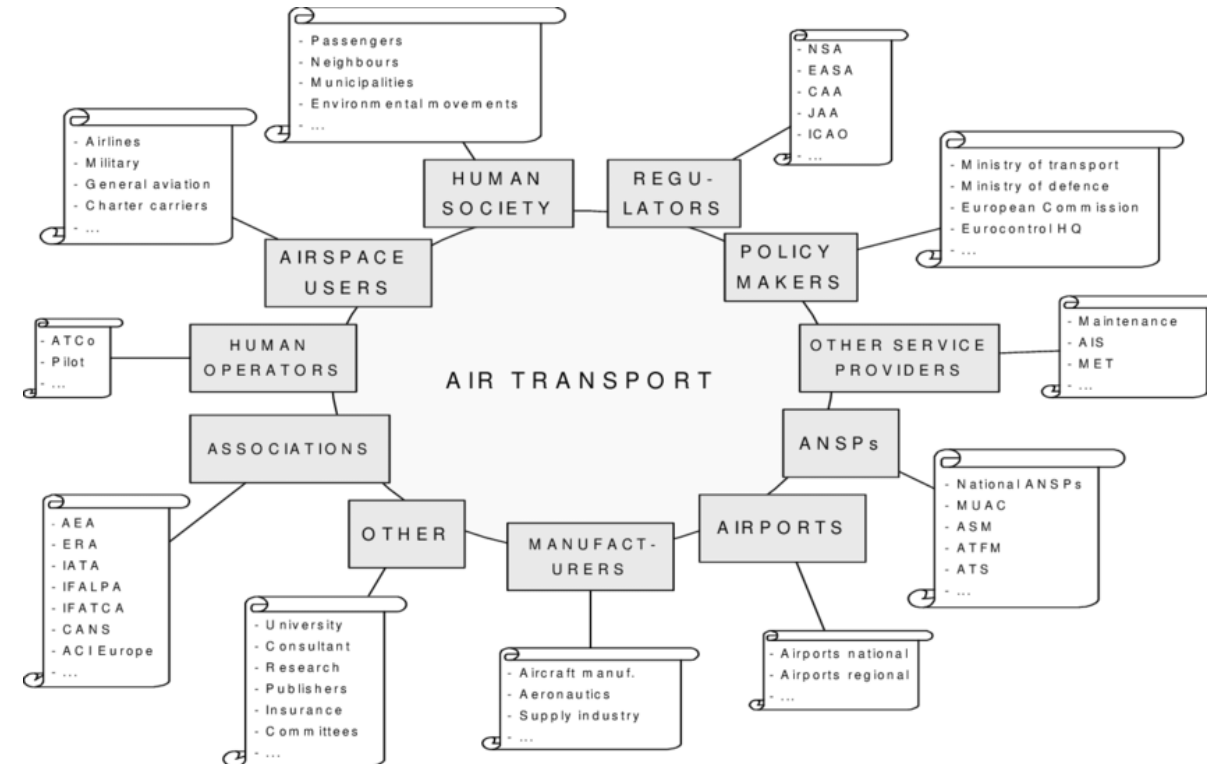
To reach net zero in the aviation industry is complex.

No particular sector can achieve it independently. It will require close collaboration among different stakeholders

- Airports
- Airlines
- Freight forwarders
- Financiers
- Fuel producers and Suppliers
- Government and Policy makers
- Industry associations
- International organizations

Government can provide important supports in providing incentives and regulatory reforms.

While there innovations coming from researchers and airline, it will take regulations and industry to make net zero an everyday reality.

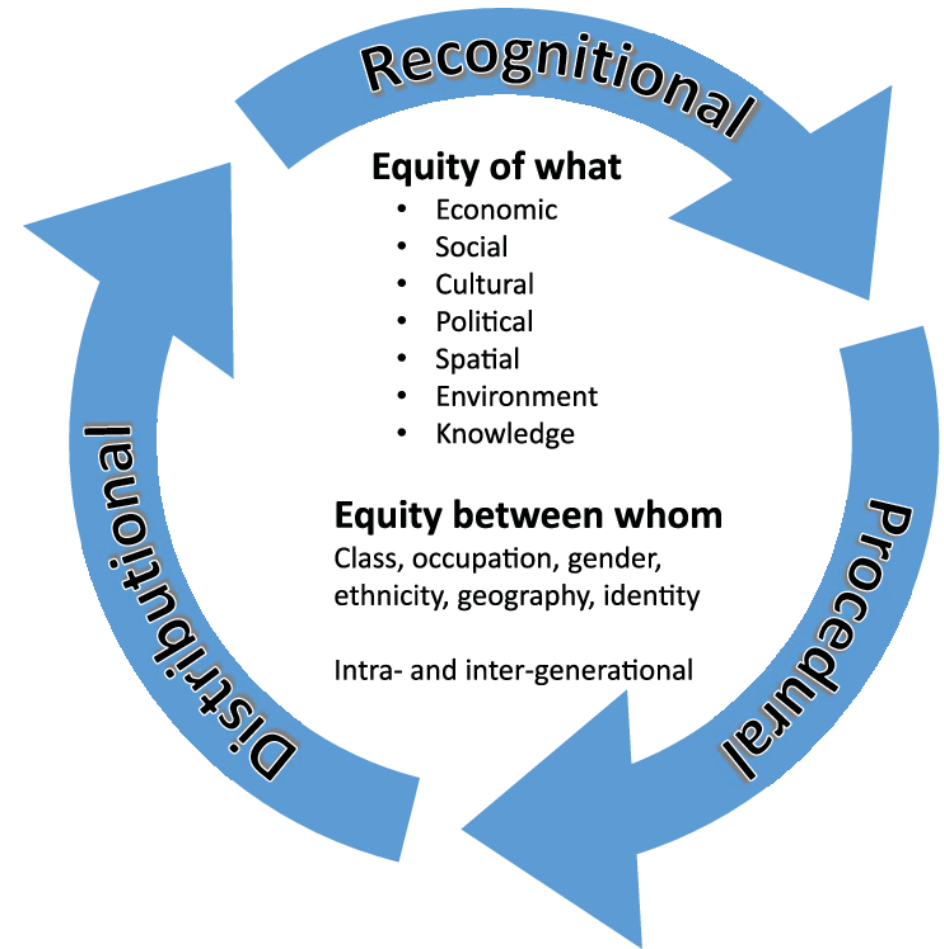


Equity considerations: who benefits, who losses?

The **'value'** of a **net zero technology** does not simply depend on the amount of CO2 that can be sequestered and the financial cost.

It is also crucial to consider the **regulatory and social contexts** in which these technologies are designed and implemented, as well as the **environmental, social and political impacts** of these technologies.

Applying a justice lens to Net Zero Aviation (NZA) means carefully examining who benefits from the development and use of NZA technologies, who pays and loses, and whose climate and development vulnerabilities will be exacerbated.



Technological solutions will have social justice implications

Sustainable Aviation Fuels (SAFs), particularly biofuels, as a drop-in replacement for conventional jet fuel.

- Biofuels from crops (e.g., palm oil, soy, maize) can contribute to deforestation, biodiversity loss, and food insecurity.
- Should the aviation needs of minority come at the cost of the socio-economic livelihoods of majority?

Hydrogen-powered aircrafts and electric aviation offer cleaner alternatives but require massive investments in infrastructure, minerals, and energy.

- Risk of replicating unsustainable extractive practices if not managed equitably.

In the Global South, where much of the renewable energy expansion may take place to meet **green fuel (i.e. electrofuels/e-SAFs) and Geologically Balanced Fuel (GBF)** demand,

- Risk that clean energy is diverted toward export for international aviation or to power DAC, while local communities continue to face energy poverty.

***Geologically Balanced Fuels (GBFs)** is a conventional aviation fuel whose CO₂ emissions are compensated for by an equivalent quantity of CO₂ being captured and permanently stored in geological formations.

Public perceptions as an additional and important layer to social justice and equity

Public perception constitutes a vital dimension in the social justice landscape of aviation decarbonization.

- People's beliefs, values, and lived experiences influence how different decarbonization strategies are received, supported, or resisted.

A lack of public trust, especially among historically marginalized communities, can undermine even the most technically sound interventions.

For instance, **proposals to offset aviation emissions via large-scale land-based carbon sequestration** have been met with **scepticism and opposition** in some regions, particularly when these projects are perceived as externally imposed, extractive, or opaque in purpose and approach to benefit-sharing.

Similarly, if the deployment of e-fuels, hydrogen, or SAFs is seen as **disproportionately serving** large aviation markets while exacerbating environmental or energy burdens in low-income areas, it may **spark public backlash** and raise questions about **procedural and distributive equity**.

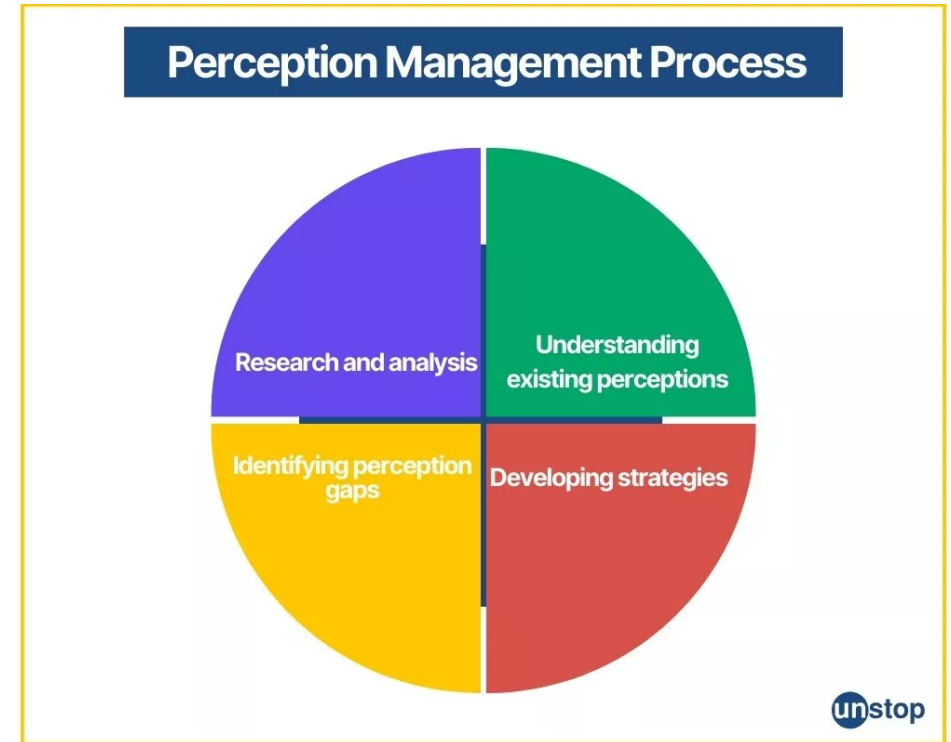
Public perception is key for decision making

Meaningful engagement with diverse publics—across geographies, social classes, and mobility patterns—is essential.

This includes not only listening to concerns, but co-producing solutions that are responsive to people's values, especially those historically sidelined in aviation and climate governance.

Designs of interventions that seek to reduce emissions in the aviation sector should therefore seek to understand the public's view on:

- (a) how the sector can reach socially acceptable net zero in the aviation sector,
- (b) how these actions can be equitable and just, and
- (c) trust in different technologies for enabling transitions in the aviation sector.



Geologically Balanced Fuels in Net Zero Aviation

18-month project looking at GBFs:

The project will assess the feasibility and potential impact of geologically balanced fuels (GBFs) as a complementary strategy to emissions reductions or more conventional Sustainable Aviation Fuel (SAF) for net zero aviation.

- Public perceptions
- Technical / economic analysis
- Carbon accounting
- Business and policy analysis



Millie



Kai



Chigozie



Nicoletta



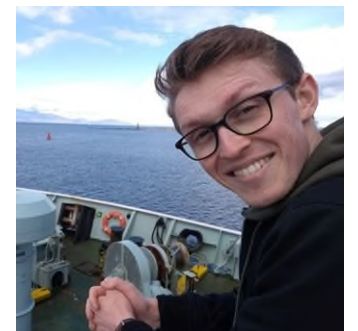
Myles



Stuart



Jessica



Tom



Public perception, equity and justice research

Public perception of Geologically Balanced Fuels (GBFs) for net zero aviation.

Global survey of 6 countries on 6 continents — Germany, Vietnam, Kenya, UAE, Brazil and Australia

- What are the perceptions on the use of GBFs for net zero aviation amongst different stakeholders and publics in different regions?
- What are the determinants of public acceptability of GBFs?
- How does public acceptability of GBFs compare to other options like SAFs, e-SAFs, and carbon offsetting?
- How does public acceptability of GBFs vary cross-country?

Geologically balanced fuels for net-zero aviation: Stakeholders perspectives, climate justice and inclusive transition pathways

- How do different stakeholders conceptualize GBFs, and what equity dimensions are associated with these understandings?
- What are the climate justice and equity implications of GBF development and deployment across different socio-geographic contexts?
- Under what social, institutional, and political conditions can GBFs contribute to inclusive and equitable low-carbon transitions?

Acceptable and Inclusive Geological Net Zero in Aviation

- How is “acceptable net zero” defined in the Aviation sector among different sets of stakeholders in the aviation sector?





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Thanks for your audience

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