



Frequently Asked Questions

Developed from [Q&A with Dr Zena Assaad: Unpacking sustainability in the aviation domain | Humanitix](#).

Session facilitated by the ANU Travel Lab, via Microsoft Teams, on 27 March 2024.

What does efficiency mean in aviation?

- For many, fuel efficiency is considered in the first instance. However, there are many factors that contribute to efficiency in aviation: travelling time, number of delays, number of cancelled flights, fuel efficiency, and availability of crew.

Is efficiency getting better or worse?

- Aviation technology is historically the most efficient it has ever been, however the aviation system as a whole is the most inefficient it has ever been. This inefficiency is because there is insufficient infrastructure to sustain civil aviation demand. Air traffic management is the most inefficient it has been because demand has surpassed the capabilities underpinning the industry and stifled innovation.
- When talking about sustainability, we tend to look at emissions per seat, or footprint per passenger mile, but emissions reductions obtained from technology efficiency would be cancelled out when considering the impact of the underlying infrastructure inefficiencies.

What are the different approaches to improving efficiency for aviation?

- A holistic rather than segmented approach is recommended to improve efficiency in aviation. There is much research on improving efficiency, but the issue is the bridge between research and implementation and Universities can help bridge that gap.
- ANU specifically has strong ties to the Government and can work with departments on the regulation side of implementation to merge aviation technologies. The aviation industry is rigid and highly regulated, so part of our role is to make regulation seem exciting, and focus on robust thorough research for implementation.

What are sustainable aviation fuels (SAFs) and how are they produced?

- SAFs are fuels made from plant based products, or from fat based products like beef tallow. They are non-petroleum based fuels.



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Are SAFs actually more environmentally friendly?

- This is an interconnected space and a definitive answer cannot be provided.
- SAFs are considered sustainable because they do not release anywhere near the same amount of emissions as petroleum based fuels. However, the research is debating the actual sustainability of developing and manufacturing SAFs.
 - For example, a lot of land is required to grow the amount of plant products required to meet the demand. For fuels derived from beef taro, the argument for sustainability is that the cows are being slaughtered anyway, so their path is the same, the taro is being used as a by-product of this pathway. However, there is question on if enough cows are being slaughtered to produce enough taro to create the fuel, or if more pressure is being put on the industry to slaughter more cows to obtain more of this fuel source.

Is it feasible (physically and cost wise) to produce sufficient sustainable fuel for the global market?

- A definitive answer cannot be provided. There isn't enough research available on the amount of fuel required per aircraft, and therefore fleets. Therefore calculations cannot be applied to determine quantities required for the industry as a whole.
- Regardless of if supply of fuels can meet demand, there is a cost issue for the industry. Petroleum based fuels are more cost effective, so airlines are unlikely to completely switch over in the near future at least.

Are synthetic fuels the only way to meet the demand for sustainability with the increasing pressure on airlines for net zero targets?

- It is more effective for the industry to put funds and infrastructure towards improving the industry as a whole rather than meeting a net zero target. The industry is reaching a peak point because while aircrafts are becoming more efficient, the inefficiency of the infrastructure and system as a whole is increasing as well. The broader infrastructure and system of aviation needs to be changed over time to achieve better sustainability outcomes.

How much do you think the growth in demand for flying is the problem in the overall efficiency of the system?

- The inefficiency is more related to the infrastructure than the demand. A thriving industry needs an increasing demand, in this instance the demand has just exacerbated the problem of inefficient aviation system infrastructure.

What is your perspective on the demand for a reduction in flying to achieve sustainability goals?

- Reducing demand is not a solution to the problem [of sustainability in aviation], the issue is the inefficient way in which the demand is being handled.

Do you see a possibility of combining different approaches to achieve sustainability?

- We need to change the narrative, we are still focused on developing more sustainable technology rather than addressing system inefficiencies, which could have a bigger impact.