

**From:** "Tourbier, Dietmar (Energy, Clayton)" <[Dietmar.Tourbier@csiro.au](mailto:Dietmar.Tourbier@csiro.au)>  
**Date:** 29 January 2024 at 2:00:59 pm AEDT  
**To:** [alex.j.mungall@gmail.com](mailto:alex.j.mungall@gmail.com)  
**Subject:** Re: Re. CSIRO and Boeing SAF Roadmap: Charting the flight path to sustainable skies

Dear Alex,

Thank you very much for sending your letter in response to the CSIRO/Boeing SAF Roadmap. I have discussed your questions and concerns with the main author of the report, who has provided most of the information in the response below.

### **Reducing emissions by onshore processing**

Lifecycle assessments (LCA) were outside of the scope of the SAF Roadmap. Other LCA reports, for example *CORSIA: The first internationally adopted approach to calculate life-cycle GHG emissions for aviation fuels*, show that transport of feedstock and fuel is a minor component compared to other steps of the process. These reports do however assume that fuel is used at the nearest point of use.

“The fuel transportation stage includes GHG emissions from transportation of SAFs from the fuel production facilities to end-use sites (i.e. aircraft refueling points); due to the international scope of CORSIA, transcontinental transport of the final product was excluded, and the closest point for fuel uplift from the point of fuel production was preferred as a more realistic option.”

Further LCA work is required to understand how many emissions would be added if the feedstock was to be exported globally, e.g. to the EU and bought back as fuel.

### **Sustainability and energy consumption of growing and converting biomass**

Using one type of feedstock to try and meet SAF requirements would cause a range of deleterious effects on agriculture and other markets. Therefore, we recommend that a portfolio of feedstocks and technologies are used to avoid the scenario described here.

Localised analysis was not completed for this project, instead our analysis was conducted from a national point of view. Localised analysis is certainly required to best understand local conditions and challenges. These types of analysis are currently being conducted by project proponents across Australia. In relation to your question: *Would the transportation of this waste in fossil fuelled vehicles change the overall atmospheric savings from a different fuel use in aviation?* It depends on the supply chain configuration used. Sugar is already transported across Queensland, therefore transportation to a different facility is likely to be negligible. Figure 9 includes emissions used in the transportation of feedstocks and fuels, which shows sugarcane derived jet fuel providing a 60% reduction in CO<sub>2</sub> compared to crude oil derived fuels.

Regarding utilising bagasse, localised analysis is certainly required to best understand local conditions and challenges. These types of analysis are currently being conducted by project proponents across Australia.

Regarding the efficient use of biofuels across industries, this is a discussion being had at the federal government level. Arguments for allocating it to aviation include that it is really the only option the industry has in the immediate term, whereas ground transport has rail, battery and hydrogen fuel cell trucks and cars. Fortunately, these processes allow to produce a number of hydrocarbon products, which can be used to decarbonise a range of users. Regarding biofuel emissions, it is true that some biofuels can emit more GHG than fossil fuels, however the definition and certification of sustainable aviation fuels requires them to be less GHG intensive than conventional jet fuel.

### **Investing in applying synthetic fuels to aviation**

Synthetic fuels are a long term solution for the aviation industry. Electrification of all industry sectors and the increase of renewable electricity is a low hanging fruit that must continue to proceed. Compared with the UK, Australia is far smaller in its population and energy use and has an endowment of significantly more wind and solar reserves. Meeting most of our local energy demands with renewables will be a more straightforward task. Synthetic fuels in Australia will be powered by excess renewables and dedicated renewable energy projects and allow Australia to use and export our excess renewables in multiple ways.

### **Alternative responses to runaway heating, other than fuel changes**

Reducing demand is one way to reduce emissions and it definitely required. Attempts at this are seen in the EU where internal flights are banned where a reasonably timed train journey is available on the same route. Unfortunately for Australia there is little infrastructure to support this shift currently, but could be an option in the future.

The challenges and opportunities of other methods are covered in our report, as well as our <https://www.csiro.au/en/work-with-us/services/consultancy-strategic-advice-services/csiro-futures/energy-and-resources/hydrogen-commercial-aviation>

I hope this information is helpful.

Please let me know if you require any additional information.

Best regards,  
Dietmar Tourbier

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