From PJ Hockey, 8 Smeaton Rd, Clunes VIC 3370

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To Kirsten Rose
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I am writing to invite you to consider retracting or amending a statement you made in your capacity as acting CEO of CSIRO, in the recent '"Sustainable" Aviation Fuel Roadmap' report: that aviation fuel solutions are available which are *"reducing its environmental impact" "to decarbonise the skies"*. We believe your optimism is unfounded for the following reasons.

An LEK consulting report from last year[1] shows potential for a maximum decrease of only 45% in emissions from available solutions. Meanwhile, Becken, Mackey and Lee (2023)[2] found that "*large-scale SAF deployment could undermine global climate efforts as aviation mitigation may be a form of energy cannibalism*". Subsequent to your report, Chatham House[3] indicate that "*technologies including efficiency, negative emissions and alternative aviation fuels will not be sufficient to manage aviation emissions if the industry keeps on growing*".

On the other hand, it is quite clear that use of jet fuel could be significantly reduced by government capping and reducing the amount circulating in the country. Then again it could be reduced should tax rates on fuel be equalised to petrol for grounded transport, instead of being 10% of the rate for petrol. You suggest confidence that alternative fuel technologies will decarbonise our skies, when your report and others suggest the contrary: that they will fail in this in the climate critical decade ahead.

Biofuels are clearly unsustainable as a climate or environment solution in the coming decades
The IPCC makes clear this is the vital decade for the response to climate change to take place. Your "Sustainable" Aviation Fuel Roadmap shows that in that timeframe we have a minimal possible increase of biofuels (capped at 60% from available feedstocks). Some of these cannibalise existing sales to the EU and Singapore, hence offshoring our emissions there. We could not see any verification by research in the report that land can be used for ongoing cropping of sugar or canola in a climate safe way nor the massive amounts of offsets airlines use. Biofuels can only be blended up to 50/50 with existing jet fuel in current planes, and we know that these are eventually 2–4 times more expensive. How could this partial, expensive solution be paid for? Then again, the overall "sustainability" of biofuels is problematic as your report admits: "*Biofuels can emit more greenhouse gases than some fossil fuels on an energy-equivalent basis …. may also compete with food production, potentially increasing the cost of essential grains and cooking oils*" Growing crops on a massive scale to be burnt at altitude is not a climate solution.
Becken, Mackey and Lee (2023) warn "*Permanent removals of CO2 are potentially inhibited by SAF".*

With Australia failing on deploying renewables, why propose synthetic or non-hydrocarbon fuels?
Beyond 2030, we will have some synthetic fuels, but this requires a massive diversion of the severely limited renewable power we have coming on. Wouldn't you agree that the efficient use of renewable power for urgent decarbonisation is to replace coal and power EVs, not produce liquid fuel for aviation? The Australia Institute[4] make clear our renewable power progress is extremely poor. And your own hydrogen reporting[5] states: *"Electrofuels start at 8 times (8x) the cost of kerosene and only reach*

[1] "*Scenario Analysis of the Future of Australian Aviation"*
[2] "*Implications of preferential access to land and clean energy for Sustainable Aviation Fuels*"
[3] "Net zero and the role of the aviation industry"
[4] "An assessment of Australia's energy transition"
[5] "Opportunities for hydrogen in commercial aviation"

*1.25-2.5x once a 50% blend is achieved, blending at this rate is likely to only occur after 2040"***.** Your report also looks into fantastical futures of potential hydrogen flight when this is quite beyond the timescales for a 1.5C or 2C challenge within which climate action must be taken.

Mis-framing the challenge instead of asking: What is a climate safe level of aviation emissions?
I suggest your report rather mis-frames the challenge of aviation emissions. Once again, it downplays the importance of non-CO2 sources of aviation warming. Vogt et al suggest this forcing is slightly reduced by non-fossil fuels, rather than the significant reduction your report characterise this as, while the UK Jet Zero Strategy states that "whilst non-CO2 emissions can have both warming and cooling effects, the net warming rate is likely to be around three times that of CO2."

On decarbonisation, even with LEK Consulting's hypothetical 75% increase (down from the tripling historically seen) most scenarios show an increase, not a reduction, in carbon pollution from aviation in 2030. Chatham House noted that *"even if these technologies do develop, to keep within the emissions limits they have set, UK demand in terms of passenger-kilometres flown in 2030 would need to be 36 per cent lower than in 2019".* Fuel changes can do little if aviation growth is not replaced with degrowth.

The big, but unaddressed, question of aviation emissions, which I would like our premium scientific body to analyse, is: what is a climate safe level of flying? We note that comments by climate scientists such as Prof Kevin Anderson would suggest your upbeat assessment of solutions is wrong. In "Does aviation have a place in a low carbon world?", he says: "If we are serious about climate change … we have to reduce our levels of using aircraft in the wealthier parts of the world."

The importance of simple effective solutions has been ignored.
With the dramatic rise to 1.48C of heating experienced in 2023, we wonder how a science body can neglect short-term measures to fix aviation's contribution from direct pollution reduction by allowing fewer planes in the sky. I remind you that aviation is such an important challenge to get right because other researchers suggest it may account for 22% of global emissions in 2050. Our calculations suggest that Australia's aviation fuel use at 22 mega-tonnes in 2021 represented 4.7% of our national carbon debt that year, rather than the 2.5% global figure quoted in your report. With non-CO2, this becomes very significant, greater than 10% in the critical decade for the climate we are in.

Please correct misunderstandings that fuel technologies are a climate solution which may stem from your report. These may cloud the judgement of politicians who may choose to bankroll highly expensive biofuel schemes that will further worsen overshoot of land use limits and biodiversity, neglect emissions from transporting crops to refineries, worsen water challenges, exacerbate our overuse of synthetic fertilisers/ weedkillers, or worsen the existing $1.2 billion subsidising of our fossil aviation by taxpayers.

Where is the decarbonisation, other than on paper?
Rather than decarbonising our skies, at most SAF can slow the growth in carbon parts per million in our atmosphere attributable to aviation. Is this perhaps what you wanted to say? It can certainly do little to decarbonise the sector. We will still be burning complex hydrocarbons at high altitude, and with biofuels, worse still: we are losing the opportunity to free up land for carbon drawdown!
By commencing your introduction to the report "I definitely count myself as one of the many who love to fly", I am reminded that scientists are just as susceptible to "motivated reasoning" as anyone else. We feel this was misjudged in the foreword to a report from Australia's most influential science body, as it serves to undermine our faith in science itself.

I invite you to correct me if I am wrong in any part of this letter and would appreciate your remarks on it, and any advice to correct any misunderstandings we may have. If you choose to correct the record on your comments, we would welcome this.

P.J. Hockey for
Flightfree Australia