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Date: Wednesday, 14 December 2022 at 04:41

To: David Lee <D.S.Lee@mmu.ac.uk>

Subject: Study proposal: Global Warming potential from Air Transport of Visitors to Hawaii

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David Simon Lee
Professor of Atmospheric Science
Manchester Metropolitan University
Aviation and Climate Research Group, Leader

Dear Professor Lee,

Aloha from Hawaii. I am a retired physician. In 2020 I wrote a casual paper, triggered by earlier casual research, on the subject of Global Warming emissions from Air Transport of Visitors to Hawaii. After a good deal of prodding, part of which is reflected in the two letters below, the Honolulu Climate Change Commission has placed 'Scoping and Assignment of Study on Global Warming from Tourism to Hawaii as Guidance Document' on their agenda for this Friday's meeting. There has been some resistance to doing a formal study on this sensitive topic. I find it surprising that a serious study has not been done previously. In 2019 there were over 10 million visitors to 'the most distant inhabited archipelago from any continental land mass on the planet'.

I will advocate that they limit the study to Air Transport emissions, as otherwise the study could become quagmired. It continues to be an open question whether they will do the study at all.

The finding of my casual study, relying on your monumental work as endorsed by the IPCC, is that global warming from air transport of visitors to Hawaii amounted to almost 2x the total net GHG emissions in terms of CO₂(e) as all of Hawaii's net domestic greenhouse gas emissions (excluding aviation) with a wide bell shaped probability distribution. This finding, if verified by the Honolulu Commission and presented to the Public, would shock the 'business as usual' underpinnings of an economy largely dependent on tourism. Thus, there is much 'at stake'. If interested, please see the links to my writings in the second letter below.

I will be offering written and oral testimony to the Commission at their Friday meeting. In the 'assignment' section of their discussion they will try to identify an appropriate entity to undertake such a study. Various reasons might suggest an external entity. My two questions would be:

1. Would your group consider being a candidate for studying the global warming emissions from air transport of visitors to Hawaii. If the scope of the Commission's decision included other aspects of tourism such as ground based emissions associated with the tourist industry, then those aspects might be assigned to some other entity for study. If your group would consider doing this study, what might you consider to be an appropriate stipend for that project.

2. Would your group consider being an expert reviewer of work done by another entity who might receive this assignment. Would there appropriately be a stipend associated with that work.

If you would have interest in this project, I will make that known at the Friday meeting. If this is not in your range of interests, then would you have suggestions of an appropriate entity which might have interest in this undertaking?

I am including a link to the HCCC's agenda for this Friday's meeting [here](#).

Please note the presence of a link to Zoom attendance at this meeting. I am also including below two of the letters which I have recently written to legislators in attempting to encourage such a study through legislation. This might be helpful in understanding context.

Thank you for your consideration, and especially thank you for a lifetime of study of this critically important and difficult subject.

Tawn Keeney MD

Dear Representative _____

In 2020, I presented a 'white paper' to the Honolulu Climate Change Commission, previously published in the e-journal Climate Emergency Digest, calculating that global warming emissions from air transport of visitors to Hawaii amounted to approximately 1-1/2x the total of Hawaii's net domestic greenhouse gas emissions. Hawaii's eminent climate scientist, Charles (Chip) Fletcher used the phrase "incredibly important data" in commenting on my paper to the Commission and recommended its presentation to the State Climate Commission.

A year later, after my repeated requests that the Honolulu Commission author or authorize a more formal Study of visitor air transport emissions, Commissioner Makena Coffman PhD., an author of the Hawaii State Greenhouse Gas Inventory, did a 'back of envelope' calculation using a different method than that which I had used. Her calculation computed global warming from visitors air transport emissions was equal to the total of all Hawaii's GHG emissions. However her method, using inventory figures, did not allow for emissions from any 'connecting flights', only the Hawaii 'leg' of each itinerary.

Subsequent to Dr. Coffman's presentation, the United Nations' Intergovernmental Panel on Climate Change (IPCC) endorsed a method as 'best science' for calculation of global warming from aviation emissions. Using that method would increase Dr. Coffman's calculation result to 1-1/2 times all Hawaii's domestic emissions, again without considering connecting flights. My result would become approximately 2x all Hawaii domestic emissions.

I have asked the Honolulu Climate Change Commission, the State Energy Office, the State Climate Commission and the Governors office to perform a formal study of global warming from air transport of visitors to Hawaii, without success. Two prominent legislative committee chairs have declined to introduce a bill into legislature for a State agency to perform this study. Until an 'official' study is done, the public, and possibly our leadership, will remain unaware of the magnitude of global warming from visitation here

It has become clear to me that this Study will not be done unless it is demanded by Legislature, the representatives of the people.

This letter is a request that you would agree to the importance of this measure, and would consent to be an introducer of a Bill for a governmental agency Study of Global Warming Emissions from Air Transport of Visitors to Hawaii. I am sending a copy of this letter to each member of the Progressive Legislative Caucus as I would expect those legislators to embrace values similar to my own - first and foremost, the preservation of our Civilization and Natural World intact for our children and grandchildren. I would hope that a number of legislators from this Caucus would introduce this measure as a group. I am sending it also to 'new faces' in your chambers in the hopes that they would also embrace those values... and some 'old friends'.

Though my request is only for a formal Study by an appropriate agency, presuming the outcome is similar to Dr. Coffman's and my own, the eventual outcome which I visualize would grow from this Study is the following:

A visitor 'green fee', within the Transient Accommodations Tax structure, would be established at \$20/night with an increase of \$5/night every year or two until the yearly revenues generated (which would be \$billions yearly) would start to drop due to decreasing numbers of visitors. (The interstate commerce clause of the constitution prevents a more direct discouragement of visitation here.) These revenues would be applied to our 'built environment' reconstruction and adaptation from climate change. The new governor is reportedly supportive of a \$50 'green fee' on each visitor, similar to last year's legislative proposal, applied to renovation from overuse of our parks and beaches. However this would be insignificant in relation to the approaching 'climate catastrophe' which, more than ourselves, the visitors coming here are responsible for through their air transport emissions. The Hawaii Tourism Authority reports the average visitor spends \$1800 on their trip here. A \$50 fee would discourage very few persons from coming. Even at \$20/night the disincentive would be small.

I am including below a letter which I wrote to Representative Lowen asking that she might introduce this Bill. Due to her heavy load she was unable to do so, though she would support this proposal in her committee if there was another introducer, and the Bill came to her. The letter, through its 'links' gives a full survey of my understanding of this issue in greater detail.

Mahalo for your tireless work,

Tawn Keeney MD

Dear Representative Lowen,

I am greatly appreciative of the response, "I'm not convinced..., but I am open to further discussion." I think you know that I have the greatest respect for your depth of insight and judgement. But those who have the most 'on their plate' need the most help in charting course.

Here is the vantage point where I stand. Best science indicates that the global warming from air transport of visitors to Hawaii approximates two times that of all of Hawaii's domestic greenhouse gas emissions (excluding aviation). My original informal study placed that at 1-1/2x all Hawaii's domestic emissions. [See 2021 edit of study [here](#)]. Dr. Makena Coffman's 'back of envelope' calculation in response, presented to the Honolulu Climate Change Commission, placed this at 'equal to' all Hawaii's net emissions, though without inclusion of any connecting flights. [Dr. Coffman's HCCC presentation is [here](#) starting at 1hr. 10min. 30sec.]

The IPCC subsequently endorsed a method for calculating warming from aviation emissions as 'best science', published in its Sixth Assessment Report (Code Red For Humanity). [See technical paper, Lee et al., 'The Contribution of Global Aviation to Anthropogenic Climate Forcing 2000 to 2018', endorsed by the IPCC in 2021 as 'best science' [here](#).] Applying that method brings my calculation of warming from visitor air transport to 2x that of all Hawaii's domestic emissions. Dr. Coffman's calculation would reach 1-1/2x all domestic emissions. Hawaii's higher flight altitude would push both calculations to a higher level than these as a result of an altitude dependent (bell shaped) probability distribution in the IPCC format. [See [response](#) to Coffman's analysis, citing the IPCC endorsement of Lee's method.]

So the first question is simple. Are the purported facts realistic. After all, though it seems incredulous, there have been no previous studies looking at this question. The State Greenhouse Gas Inventory lists 'Domestic Aviation' emissions at 3.4 million tons. Dr. Coffman was one of the authors of the State Inventory. She used its figures in presenting to the HCCC the calculation of emissions from visitor air transport here at 13.5 million tons. This is equal to the State GHG Inventory report of all Hawaii's domestic GHG emissions at 13.6 million. But again, if we use the IPCC endorsed method, Dr. Coffman's calculation would become 20 million tons, without inclusion of any connecting flights.

Second, if these are facts, are they important? Charles Fletcher, PhD., Hawaii's renowned climate scientist, used the phrase 'incredibly important data' in addressing the Honolulu Climate Change Commission in response to my paper, and it was recommended to be presented to the State Climate Commission. It is proposed that global warming from air transport of visitors approximates twice that of all Hawaii's domestic emissions, 3x that of all electricity generation (8 million tons), and 6x that of all ground transportation (4 million tons). If it is important that we change our electricity production to solar and wind, or change our ground transportation to electric vehicles, then it is obviously important that we understand the magnitude of visitor air transport emissions, as this value would dwarf emissions from those sources.

I think we can all agree that we would want leadership to be aware of what these numbers are, otherwise we are driving blind. Is leadership aware of this? First ask yourself if you have been aware and convinced of this magnitude of visitor transport emissions. I have written previous papers which have been sent to all legislative e-addresses. I have presented these calculations in 2020, '21 & '22 to the HCCC, each time asking for a more robust and authoritative study. Each time the response has been that it is a 'State issue'. This Honolulu Commission has authored or authorized eight important, deeply researched, 'Guidance Documents'. All of the titles indicate that these studies arise as statewide or global issues and concerns, which have incidental application to Honolulu, just as is the case with emissions from air transport of visitors to Hawaii. [See titles [here](#).] I have sent my informal, preliminary study to the State Climate Commission, the State Energy Office and the Governors office with request for formal study long ago. No response. Are these findings accepted as realistic? It's unknown if these papers have been read. (Scott Glenn, another individual who deserves the greatest respect, has been aware of these studies since 2021).

But you, as legislator, represent the people of Hawaii. It is safe to say that the people of Hawaii have no understanding of the magnitude of warming from visitor aviation emissions. Civil Beat refused to print my submission. The Star-Advertiser printed a condensed version in the page 5 editorial section. So, the important question is, 'Do we want the people of Hawaii to have this understanding? Because, if so, the only way in which this will be accomplished is if the representatives of the people, through their legislature, demand that this study be done. I can speculate that it is not in the interest of 'things as usual' that this information is public. So, do you, as representative of the public, wish to have the magnitude of global warming from visitor air transport here understood by that public. If your answer is 'No' or 'The public is not interested in this kind of information.' then I respond that this represents what UN Secretary General Guterres, in introducing the IPCC 6th Assessment Report to the world last year, famously called the 'criminal abdication of leadership'. If your reply reflects a sentiment that we should do nothing to compromise our visitor industry, then I will remind you of Guterres apt analogy that we are driving heedlessly into the abyss of civilizational and natural systems collapse with our foot on the accelerator. And I would conclude that you are part of the problem rather than the solution.

But I trust that this is not your response. You are careful and measured and struggle with a world of compromises. You recognize that this bill will not get past Onishi or.... My confidence is that ultimately your response reflects truth, even if it only accomplishes shining a light on the darkness.

Mahalo for your consideration.

Tawn

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