HAWAII VISITOR AIR TRAVEL EMISSIONS AS CONTRIBUTOR TO GLOBAL WARMING

This paper attempts to answer the question “How much global warming emissions are generated though air travel of visitors to Hawaii?” Though discussion and criticism will appropriately arise, the core answer will be 18 million tons of CO2(equivalent) emissions arose from air travel of visitors in 2019. To gain perspective on this number, the emissions from all of Hawaii’s Stationary Combustion (electricity generation from power plants, petroleum refineries, etc.) was 7.8 million tons CO2(e), and all emissions from ground transportation in the islands reached 4 million tons CO2(e). (Hawaii State Greenhouse Gas Inventory) It is therefore proposed that Hawaii’s imperative efforts toward conversion of power generation and ground transportation to zero emissions sources will make only modest improvement in the state’s emissions profile if we continue to host the current numbers of visitors.

The derivation of the figure of 18 million tons CO2(e) from visitor transport must be understood.

REGION	# of VISITORS	ORIGIN CITY	ROUND TRIP MILES	EMISSIONS -CO2(e)
U.S. West	4,600,000	Portland	5,200	6,440,000 tons
U.S. East	2,300,000	Washington D.C.	9,600	5,750,000 tons
Japan	1,600,000	Tokyo	7,600	1,600,000 tons
Canada	500,000	Vancouver B.C.	5,400	700,000 tons
Europe	140,000	London	14,000	546,000 tons
Oceania	360,000	Sydney	10,000	972,000 tons
Korea	230,000	Seoul	9,200	552,000 tons
China	90,000	Shanghai	9,800	234,000 tons
			EMISSIONS (EQUIVALENTS CO_2) TOTAL:	18,394,000 tons

The above table, in it’s first two columns, collates information from the Hawaii Tourism Authority 2019 data regarding numbers of visitors from each of 8 ‘Regions of Origin’. The third column chooses an origin airport representative of that ‘region’. The fourth column calculates the round-trip miles in the most direct flight itinerary from that origin airport to Honolulu. We will discuss the 5th column momentarily as we choose the correct method to convert each itinerary into it’s CO2(e) emissions.

For this discussion the number of miles traveled for each passenger itinerary, and the CO2(e) emissions for which each passenger is responsible, are calculated by the Carbon Offset websites. The several available carbon offset websites calculate carbon emissions from various activities including air transportation and then allow the purchase of ‘offsets’ to be applied to environmentally restorative projects to compensate for those emissions. Each ‘offset’ website has it’s own methodology for these calculations.

The number of miles traveled by visitors from each region is derived from the most direct itinerary from the chosen airport in that region to Honolulu. Factoring the number of travelers from each region in 2019, it is determined that the average visitor to Hawaii travels approximately 7,000 miles in their round-trip to the 'most remote inhabited archipelago from any continental land mass' on the planet. From the 2019 Hawaii Tourism Authority data, Hawaii hosted 10 million such visitors in 2019 (70 billion miles traveled). I must pause to acknowledge that we don't know what percentage of those travelers might have been stopping here in an otherwise necessary trip across the Pacific, or how Hawaii as destination might have been shaped by other travel plans. That limitation of this study should be understood.

The calculation of the emissions associated with flight itineraries is the major accomplishment of the Carbon Offset websites. In order to determine which website we would use for our calculations, we looked at eight of the most commonly used international websites and calculated the emissions burden of round-trip flight for the example: Portland to Honolulu. The outcome was as follows:

ICAO (International Civil Aviation Organization):	1,317 lbs. CO_2
Terrapass (US):	3,365 lbs. CO_2(e)
Atmosfair (German):	3,740 lbs. CO_2(e)
Sustainable Travel International:	2,640 lbs. CO_2(e)
My Climate:	2,800 lbs. CO_2(e)
Native Energy:	3,460 lbs. CO_2(e)
Carbon Footprint:	2,340 lbs. CO_2(e)
Climate Care (British):	2,500 lbs. CO_2(e)

(This British site multiplies the carbon emissions by 1.9 to account for non-carbon emission, as recommended by the British government environmental agency)

The Carbon Offset website coming closest to the average (2,770 lbs.) of the calculated values is the site My Climate. I have therefore chosen this Offset calculator to derive the emissions reflected in Column 5 of the above table. However, it is imperative that one understands the reasons between the large discrepancy between the calculations of ICAO and those of the other Offset sites.

Other than ICAO, the computations of the carbon offset sites include the 'non-CO_2' emissions and other factors which go tho make up the Radiative Forcing Index and Global Warming Potential. These are measures of the total heating potential of any activity, not just the CO_2 emissions. The IPCC, through the work of various investigators has determined that in air traffic flying above 9,000 meters (which would comprise 90% of all flight time to Hawaii) the non-CO_2 emissions such as water vapor and ice crystals (as contrails) and nitrogen oxides and particulates are substantially more contributive to global warming than the CO_2 emissions themselves, up to a factor of 2x. Most regional air traffic does not reach this height. For a more complete description of these factors and calculations see the Atmosfair Carbon Calculator Methodology (particularly Chapter 4 on non-CO_2 emissions) here:

https://www.atmosfair.de/en/standards/emissions_calculation/emissions_calculator/

The ICAO (which, though UN affiliated, is airline industry operated) computations do not acknowledge 'non-CO_2' factors. Atmosfair factors Non-CO_2 emissions above 9,000 meters as equivalent to fully 2x the CO_2 emissions, acknowledged by the IPCC with "not less than low confidence (not 'very low')". This then is added to the CO_2 component of emissions. Countries such as Austria or Germany consider a warming effect of non-CO_2 that is comparable to CO_2 in national assessments of aviation impacts. This reflects that much of their air traffic is regional and below 9,000 meters. The IPCC has indicated that they will address the issue of ‘non-CO_2’ factors again in their 2021 assemblies. Suffice it to say that there is uncertainty in how to apply the ‘non-CO_2 emissions’ factor. However, the Precautionary Principle should apply to all climate change associated considerations. The five pages of Documentation and References at the end of this paper focuses on the issue of the importance of ‘non-carbon emissions’.

Using the emissions calculator of the carbon offset site ‘My Climate’ as the mid-way or middle-ground method between ICAO and Atmosfair, and applying it to the representative airport from each of the origin airports and factoring the number of visitors from that region, we derive the emissions of CO_2(e) from that region. Adding these we derive a total emissions of over 18 million tons from visitor air travel to Hawaii.

It follows that, with 10 million visitors in 2019, the ‘average’ visitor’s emissions burden is 1.8 tons CO_2(e) from his round trip flight. It is important to understand this 1.8 tons emission burden for the average visitor in terms of the notion ‘climate justice’. The IPCC in late 2020 has recalculated the equitable yearly CO_2(e) budget for each world citizen.. There is a 66% chance of keeping world temperature increase below 1.75 degrees C if a yearly equitable carbon budget for each world citizen of 2.75 tons CO_2(e) emissions is achieved and world CO_2(e) emissions reach net 0 by 2050. That visitor has ‘blown through’ 2/3 of this yearly equitable budget in his flight to Hawaii. Further, because the government of Hawaii, through funding the Hawaii Tourism Authority, actively promotes this tourism for the benefit of it’s people, the citizens of Hawaii must assume ownership of these emissions. Each Hawaii resident has thereby appropriated the equitable carbon emissions allotment of five world citizens. (18 million tons/1.4 million residents/2.75 tons/person). The carbon budget calculations do not include positive feedback loops such as progressive methane release from melting arctic permafrost or drying or burning of the Amazon rainforest. Nature Conservancy states that the US average yearly carbon emissions now amounts to 16 tons per person and the yearly global average is 4 tons.

It is notable that the Hawaii State 2019 Greenhouse Gas Inventory designates the category ‘Domestic Air Transport’. It reports the 2019 emissions as 3.2 million tons CO_2(e). This category includes inter-island flights and flights departing from Hawaii to the US mainland. It does not include US mainland arrivals. It does not include international flights (either arrivals or departures). It does not include the ‘non-carbon emissions’ above 9,000 meters (considered to have up to twice the global warming potential of the accompanying CO_2 emissions, and which comprises 90% of the flight time to and from Hawaii.)

Will the development of Sustainable Aviation Fuel be the answer for the Hawaii Economy’s reliance on tourism? Because of EU’s cap & trade policy Europe may have taken the lead in SAF development. A European study estimates that by 2030, with ideal policy support and continued favorable conditions, plant based SAF could account for 6% to 9% of European air transportation fuel use. < https://skynrg.com/news-and-inspiration/expert-opinions/expert-opinion-on-green-horizons/ > Though we should explore SAF, we should not paint the picture that aviation is about to become sustainable. Hydrogen powered flight is being actively investigated. However, I refer to calculation by a French astrophysicist of the amount of renewable electricity required to make the hydrogen sufficient to power all current flights at Charles de Gaulle Airport: 5,000 sq. kilometers of wind turbines or 1,000 sq. kilometers of solar panels. < https://www.youtube.com/watch?v=vPoDjNWJJ0w >

Ultimately, advertisement of Hawaii as a visitor destination must be abandoned. This imperative will eventually be forced upon us, but by being proactive we could lead the world in commitment to climate change mitigation. However, if the Hawaii Tourism Authority’s $80 million budget for the promotion of tourism were discontinued, the multi-billion dollar visitor industry itself would quickly step in with funding for advertising Hawaii. Though the public would save this money, which is derived from the Transient Accommodations Tax, the visitors would keep coming, the goal would not be achieved. In 1990, 8 years before promotion of tourism by public funding through creation of the HTA, the Hawaii Visitors Bureau reported 7 million visitors.

Another approach might be to modify a modest proposal currently before legislature of a $20 'green fee' applied to the TAT for each Hawaii visitor. This $20 Transient Accomodations 'Green Fee' could become a nightly fee. This nightly fee could be raised by $5 to $10 each year until the number of visitors in the preceding year had fallen to the 'desirable' level. Hopefully this level would reflect respect for the above notion of 'climate justice'. What is that level? Keith Amemiya, as candidate for mayor, was asked that question. His reply (after some thought) - "somewhere around 6 million". This examiner would place that number lower.

The Hawaii Tourism Authority reports that the 'average' visitor to Hawaii spends $1,800 on their visit. Is that visitor going to be dissuaded from his 10 day visit by an extra $200 spent as 'green fee'? A few, but not most. The Hawaii Tourism Authority has endorsed the position that perhaps 2019's numbers reached 'too many', and that we may want to reduce the number of budget or economy travelers, but continue to encourage the more high end or extravagant visitors. Those 'higher end' travelers will not even notice the extra $20 per day spent.

Our world is 'on fire'. Twice in the past year, temperatures have been recorded above the arctic circle at 100 F or higher. These times are unprecedented. This is the beginning. The scientists are saying that global warming is coming faster than they had imagined possible. It is time for commitment.

DOCUMENTATION AND REFERENCES

1. Yerton, S. (2019, August 27). Air Travel's Carbon Footprint Takes a Big Environmental Toll in Hawai'i. *Civil Beat*.

https://www.civilbeat.org/2019/08/air-travels-carbon-footprint-takes-a-big-environmental-toll-in-hawaii/

2. Shkvorov, A. (2020, July 3). Hawai'i's Runaway Tourism. Excerpts from the transcript of the main presentation delivered during the virtual colloquium "Hawai'i's tourism futures: What constrains the realm of possibilities?"

http://hrt.hawaii.red

3. Atmosfair Emissions Calculator Methodology.
Chapter 4: Climate Impact of Non-carbon Emissions.

https://www.atmosfair.de/en/standards/emissions_calculation/emissions_calculator/

Chapter 4 Summary:

Aircraft engines emit various pollutants that contribute directly or indirectly to raising global temperatures. Among them, carbon dioxide (CO_2) is the easiest to explain in terms of origin and effect. The combustion of kerosene produces CO_2: the more kerosene is consumed, the more CO_2 is produced. CO_2 is used as the basis for calculating climate damage. Other pollutants and their effects can be summarized using an internationally recognized calculation method and these warming effects can hence be converted into those of CO_2. First, the emissions calculator calculates the fuel consumption per passenger and based on this result, determines the amount of CO_2 that has a comparable effect to that of all other pollutants emitted by the flight added together (effective CO_2 emissions). This is the calculator's final CO_2 output, which Atmosfair will then offset through climate protection projects.

The degree of climate impact for emissions and their effects depends on the altitude and the state of the atmosphere at the time of the flight and when the aircraft emits the pollutants. The emissions calculator only processes the non-carbon emissions when the flight profile exceeds 9000-meter altitude. For a short-haul flight of 400 km, the amount of time spent at over 9000 m usually equals 0% of the flight profile (depending on the aircraft type) and then gradually rises to over 90% (for distances of 10,000 km and beyond). In order to properly include the effect of those emissions in the calculations, the CO_2-emissions produced at over 9000 m are multiplied by two and then added to the actual carbon emissions ("factor 3").

The effects those pollutants have on the climate have been described in detail by the IPCC, the Intergovernmental Panel on Climate Change (IPCC 1999, 2013), and by subsequent studies directly based on the IPCC's findings (Grassl, Brockhagen 2007). This document will only address the major pollutants and their effects. See the above Atmosfair website for further discussion.

4. Articles referencing the contribution of 'non-CO_2' air transport emissions to global warming.

4.1. Gössling, S. & Humpe, A. (2020). The global scale, distribution and growth of aviation: Implications for climate change. *Global Environmental Change* 65, 102194.

https://www.sciencedirect.com/science/article/pii/S0959378020307779

An important omission of Kyoto Protocol and Paris Agreement is their focus on CO_2 and other long-lived greenhouse gases, ignoring aviation's contribution to radiative forcing from short-lived emissions such as nitrous oxides (NOx), or in the form of contrails or clouds (H_20) (Lee et al., 2020). These non-CO_2 emissions are not directly comparable with long-lived GHG, but they do contribute to global warming (Lee and Sausen, 2000).
Non-CO_2 warming is expected to remain relevant in the short and medium-term future (Bock and Burkhardt, 2019). To account for non-CO_2 warming, countries such as Austria or Germany consider a warming effect of non-CO_2 that is comparable to CO_2 in national assessments of aviation impacts (Environment Agency Austria, 2018; German Environment Agency, 2018). In 2018, aviation has been estimated to account for 2.4% of anthropogenic emissions of CO_2 including land use changes (Lee et al. 2020). There is an additional warming effect related to contrail cirrus and NOx, which is larger than the warming from CO_2, if calculated as net effective radiative forcing. Lee et al. (2020:2) conclude that "aviation emissions are currently warming the climate at approximately three times the rate of that associated with aviation CO_2 emissions alone".

4.2. Le Page, M. (2019, June 27). It turns out planes are even worse for the climate than we thought. *New Scientist*.

https://www.newscientist.com/article/2207886-it-turns-out-planes-are-even-worse-for-theclimate-than-w e-thought/

Burkhardt and her colleagues used a computer model of the atmosphere to estimate how much warming contrails caused in 2006 – the latest year for which a detailed air traffic inventory is available – and how much they will cause by 2050, when air traffic is expected to be four times higher. The model accounts for not only of the change in air traffic volume, but also the location and altitude of flights, along with the changing climate. The team concludes that the warming effect of contrails will rise from 50 milliwatts per square metre (mW/m^2) of Earth's surface in 2006 to 160 mW/m^2 by 2050. In comparison, the warming due to CO_2 from aviation will rise from 24 to 84 mW/m^2 by this time. In a scenario in which the airline industry increases fuel efficiency and reduces the number of soot particles emitted by improving fuels and engines, the warming from contrails by 2050 is limited to 140 mW/m^2 and the warming from CO_2 to 60 mW/m^2.

4.3. Timperley, J. (2017, March 15). Explainer: The challenge of tackling aviation's non-CO_2 emissions. *CarbonBrief*.

https://www.carbonbrief.org/explainer-challenge-tackling-aviations-non-co2-emissions

4.4. Larsson, J., et al. (2018). Measuring greenhouse gas emissions from international air travel of a country's residents. *Environmental Impact Assessment Review 72*: 137-144.

https://www.sciencedirect.com/science/article/pii/S0195925517303116

There are also non-CO_2 effects from aviation on the climate including nitrogen oxides, contrails, and aviation-induced cirrus clouds (Azar and Johansson, 2012; Boucher et al., 2013; ICAO, 2013; David S Lee et al., 2010). There are significant uncertainties about how large these effects are. Our choice to include them is mainly based on that they are accounted for in the last scientific review carried out by the IPCC (Boucher et al., 2013). We apply this by using the most cited scientific estimate (David S Lee et al., 2010). The inclusion of non-CO_2 effects is done by multiplying CO_2 emissions by an Emission Weighting Factor (EWF). The EWF is highly dependent on the time perspective considered: the shorter the time perspective, the higher the EWF will be. In this paper, we used Global Warming Potential (GWP) with a 100-year perspective, for which the EWF is 1.9 (Lee et al., 2010).

4.5. Sullivan, A. (2020, January 21). To fly or not to fly? The environmental cost of air travel. *Deutsche Welle*. https://www.dw.com/en/to-fly-or-not-to-fly-the-environmental-cost-of-air-travel/a-42090155

Many estimates put aviation's share of global CO_2 emissions at just above 2 percent. That is the figure the industry itself generally accepts.

But according to Stefan Gössling, a "professor at Sweden's Lund and Linnaeus universities and co-editor of the book Climate Change and Aviation: Issues, Challenges and Solutions, "That's only half the truth." Other aviation emissions such as nitrogen oxides (NOx), water vapor, particulates, contrails and cirrus changes have additional warming effects. "The sector makes a contribution to global warming that is at least twice the effect of CO_2 alone," Gössling told DW, settling on an overall contribution of 5% "at minimum." A few years ago, environmental group

Germanwatch estimated that a single person taking one roundtrip flight from Germany to the Caribbean produces the same amount of damaging emissions as 80 average residents of Tanzania do in an entire year: around four metric tons of CO_2.

4.6. IPCC. (1999). Aviation and The Global Atmosphere. J.E.Penner, D.H.Lister, D.J.Griggs, D.J.Dokken, M.McFarland (Eds.) Prepared in collaboration with the Scientific Assessment Panel to the Montreal Protocol on Substances that Deplete the Ozone Layer Cambridge University Press, UK.

https://www.ipcc.ch/report/aviation-and-the-global-atmosphere-2/

In an attempt to aggregate and quantify the total climate impact of aircraft emissions, the Intergovernmental Panel on Climate Change (IPCC) estimated that aviation's total climate impact is some two to four times that of its direct CO_2 emissions alone (excluding the potential impact of cirrus cloud enhancement).

4.7. Azar, C. & Johansson, D. J. A. (2012). Valuing the non-CO_2 climate impacts of aviation. Climatic Change 111 (3-4): 559-579.

https://link.springer.com/article/10.1007/s10584-011-0168-8

While the principal greenhouse gas emission from powered aircraft in flight is CO_2, other emissions may include nitric oxide and nitrogen dioxide (together termed oxides of nitrogen or NOx), water vapor and particulates (soot and sulfate particles), sulfur oxides, carbon monoxide (which bonds with oxygen to become CO2 immediately upon release), incompletely burned hydrocarbons, tetraethyllead (piston aircraft only), and radicals such as hydroxyl, depending on the type of aircraft in use. Emissions weighting factor (EWFs) i.e., the factor by which aviation CO_2 emissions should be multiplied to get the CO_2-equivalent emissions for annual fleet average conditions is in the range 1.3–2.9.

4.8. Jardine, C. N. (2009). Calculating the Environmental Impact of Aviation Emissions. https://www.eci.ox.ac.uk/research/energy/downloads/jardine09-carboninflights.pdf

In 1999 the contribution of civil aircraft-in-flight to global CO_2 emissions was estimated to be around two percent. However, in the cases of high-altitude airliners which frequently fly near or in the stratosphere, non-CO_2 altitude-sensitive effects may increase the total impact on anthropogenic (human-made) climate change significantly. A 2007 report from Environmental Change Institute/Oxford University posits a range closer to 4% cumulative effect.

4.9. Faber, J. & Nelissen, D. (2017). Towards Addressing Aviations Non-CO_2 Climate Impacts. *CE Delft*.
https://www.cedelft.eu/publicatie/towards_addressing_aviations_non-co2_climate_impacts/1961

Aviation has different impacts on the climate. While the EU and ICAO have started to address the impacts of CO_2 emissions, the other impacts remain unaddressed directly. This note argues that they should be addressed in line with established European policy as well as because of the precautionary principle.

In terms of radiative forcing, the non-CO_2 climate impacts of aviation are estimated to be about as large as the impacts of CO_2. In other words, the cumulative effect of the non-CO_2 impacts on the current climate is about as large as the cumulative effect of aviation CO_2 emissions. (Note, however, that radiative forcing is not a good metric for designing policies as it tends to measure the impact of past activities rather than influence future activities, and so does not fully account for the different lifetimes of the CO_2 and non-CO_2 impacts).

In view of the impact of aviation's non-CO_2-emissions on climate, there are good reasons to implement policies to address them. The uncertainty about the exact size of the impact is not a valid argument to postpone action when the precautionary principle applies. This section shows that this appears to be the case.

In its communication on the Precautionary Principle, the European Commission (EC, 2000) states that the precautionary principle can be invoked to take action when the following criteria are met:

- It should be "considered within a structured approach to the analysis of risk which comprises three elements: risk assessment, risk management, risk communication. The precautionary principle is particularly relevant to the management of risk".
- "Potentially dangerous effects deriving from a phenomenon, product or process [should] have been identified".
- "Scientific evaluation does not allow the risk to be determined with sufficient certainty".

Each of the criteria has been met for non-CO_2 climate impacts of aviation.

There exists a well-established EU policy to deal with emissions causing climate risks in general, as is evident from the 2020 climate and energy package and the 2030 climate and energy framework, for example. This policy underlies the EU ETS and effort sharing, as well as policies aimed at for example fluorinated greenhouse gases. The EU policy contributes to a global policy framework within the UNFCCC.

The potentially dangerous effects of climate emissions, including aviation NOx-emissions, have been identified, but there is ongoing discussion about the size of the impact.

Although it is clear that the non-CO_2 climate impacts add to the global temperature increase, the level of scientific understanding of the aviation non-CO_2 impacts is still considered too low to calculate the risks exactly (Lee, et al., 2010). Moreover, there is an ongoing discussion about the relevant metric for comparing long-term and short-term climate impacts which is in itself not a scientific but rather a political decision because it depends on the type of risk that a society is willing to accept.

4.10. Hemmings, B. (2017). The non-CO_2 impacts of aviation must be tackled. [A *Transport & Environment* briefing]. Brussels.

https://www.transportenvironment.org/sites/te/files/publications/2017_06_non CO2_aviation_briefing_final_0.pdf

Non-CO_2 effects of aviation have been acknowledged by scientists but ignored by policymakers. It is estimated that gases other than CO_2 have at least as large a climate impact as CO_2. The European Commission has so far failed to address aviation's non-CO_2 effects despite undertaking to do so in 2008. This risks undermining the EU's climate policy. T&E recommends the Commission now acts on its 2008 promise and proposes a charge on NOx emissions and earmarks funds for research into other non-CO_2 effects such as contrail and cirrus formation and their avoidance.

Measures proposed or in place to address aviation's climate impact, such as EU Emissions Trading System (EU ETS), the CO_2 standard for new aircraft or the proposed global measure

(CORSIA), only address CO_2 emissions from aviation. However, aviation's non-CO_2 climate effects including NOx emissions at altitude, contrails, cirrus cloud formation, soot and water vapor etc. can equal or exceed the climate impact of aviation CO_2.

European Commission Brussels, 3.2.2017 Commission Staff Working Document Proposal for a regulation of the European Parliament and of the Council amending Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community in view of the implementation of a single global market-based measure to international aviation emissions.

The Commission's Impact Assessment accompanying its February 2017 ETS proposal restates the high importance of non-CO_2: "Aviation also has non-CO_2 impacts, such as emissions of NOx and water vapor at high altitudes, which have been estimated to have several times the impact of aviation's CO_2 emissions. This impact assessment does not further consider these impacts."

EU's Clean Sky Initiative: "Aviation climate scientists tell us there is a dearth of research funds into aviation non-CO_2. Industry greatly influences funded research projects and won't have pushed for such work as there are no financial benefits to carriers of reducing non-CO_2 effects."

4.11. Sims R., R. Schaeffer, F. Creutzig, X. Cruz-Núñez, M. D'Agosto, D. Dimitriu, M.J. Figueroa Meza, L. Fulton, S. Kobayashi, O. Lah, A. McKinnon, P. Newman, M. Ouyang, J.J. Schauer, D. Sperling, and G. Tiwari, 2014: Transport. In: *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter8.pdf

Author's Note

The accompanying article should be considered a 'living document'. It is a first effort at communicating conclusions which may change shape as more data and more perspectives are assembled in service to the important examination of environmental and societal consequences of visitor travel to Hawai'i. Further investigation will be ongoing and contributions to this discussion are welcomed.

Tawn Keeney, MD

Hawaii Climate Change Mitigation and Adaptation Commission
April 7, 2021 at 1:00 p.m.
Video conference

Aloha. My name is John Kawamoto, and I'd like to submit testimony relating to the UHERO report on carbon pricing.

To its credit, the State Climate Commission has been advocating for carbon pricing for several years now. The UHERO study substantiates the Commission's understanding that the carbon fee and dividend model would substantially reduce carbon emissions while being equitable because low-income households would benefit financially.

A carbon fee and dividend bill was introduced this legislative session in the House and Senate, but it died, along with the other carbon pricing bills. Unfortunately, the UHERO study was not a factor because it was issued after all of these bills died. Attention should be shifted to the 2022 legislative session.

As you know, one of the Commission's statutory mandates is to advise and governor, legislature and counties on the economic and budgetary ramifications of climate change impacts, mitigation, and adaptation.

The Commission would be acting in accordance with its statutory mandate, and also its stated mission, by sponsoring and promoting a carbon fee and dividend bill in the 2022 session. Other State agencies initiate bills, and the Commission can do the same.

Carbon pricing makes sense, and it is supported by the public. At the hearing by the House Energy and Environmental Protection Committee on HB 1319, a carbon pricing bill, 33 individuals and agencies supported the measure, while only 7 opposed it.

The Commission is a respected agency, so if the Commission and its members seriously promote the carbon fee and dividend model by sponsoring a bill and advocating for it, the Legislature would certainly give it serious consideration.

Mahalo for the opportunity to testify.

John Kawamoto
808-852-2656
jk1492@gmail.com
D01810F1-62C0-4138-AAE4-0439BDED69CF