



HAWAII STATE ENERGY OFFICE STATE OF HAWAII

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Testimony of
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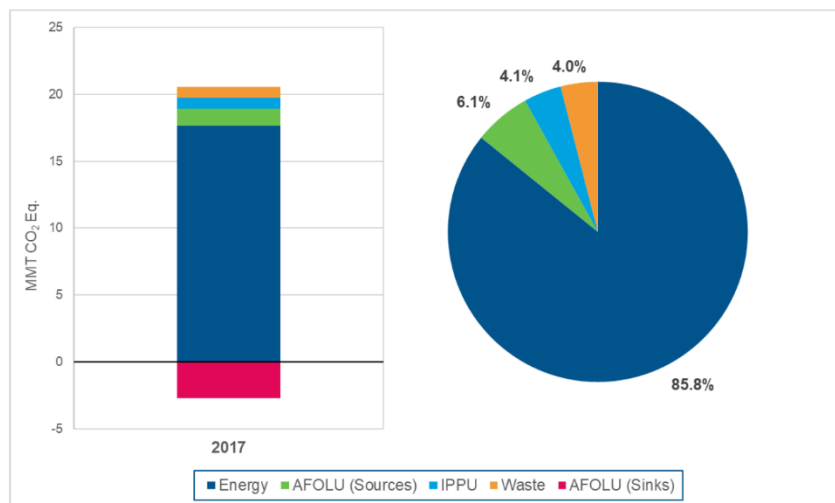
before the
**SENATE COMMITTEES ON
ENERGY, ECONOMIC DEVELOPMENT, AND TOURISM
AND
AGRICULTURE AND ENVIRONMENT**

Monday, February 14, 2022
3:00 PM
State Capitol, Conference Room 224 & Videoconference

**SUPPORT
SB 3163
RELATING TO RELATING TO THE STATE ENERGY OFFICE.**

Chairs Wakai and Gabbard, Vice Chairs Misalucha and Nishihara, and Members of the Committees, the Hawai'i State Energy Office (HSEO) supports SB 3163, which directs the State Energy Office to develop and submit a plan for construction of an atmospheric carbon capture plant in the State by the year 2030.

Most of Hawai'i's carbon emissions are from the energy sector, and emissions from all sectors far exceed the removal capacity of local carbon sinks provided by the agricultural, forestry, and land use sectors.¹



Notes: Totals may not sum due to independent rounding. Percentages represent the percent of total emissions excluding sinks.

¹ State of Hawai'i. Department of Health. Hawai'i Greenhouse Gas Program, Emissions Report for 2017. https://health.hawaii.gov/cab/files/2021/04/2017-Inventory_Final-Report_April-2021.pdf

To carry out its mission to promote energy efficiency, renewable energy, and clean transportation to help achieve a resilient, clean energy, decarbonized economy the HSEO notes the vital interconnection between policies, including the [renewable portfolio standard](#), [energy efficiency portfolio standard](#), and the [zero emissions clean economy target](#), which aims to locally sequester more atmospheric carbon and greenhouse gases than emitted within the State as quickly as practicable, but no later than 2045.

Renewable energy deployment alone will not achieve Hawai'i's goal of a net-negative carbon economy. Carbon capture technologies are needed for the world and for Hawai'i to sequester atmospheric carbon long-term, an action that is necessary to keep the global temperature from exceeding 1.5 degree Celsius, pursuant to Hawai'i and the federal government's commitment to the Paris Climate Agreement.²

The United States Department of Energy, and others in the energy sector, are funding and developing carbon capture technologies. One of the technologies is referenced in SECTION 1 of the bill. If enacted, the passage of SB 3163 will indicate Hawai'i's support for such efforts and may assist Hawai'i in competing for and obtaining Federal funds.³

Hawai'i has attributes and assets that can contribute meaningfully to the deployment and demonstration of carbon removal, especially when paired with long-term sequestration technologies such as [carbon mineralization](#). Carbon dioxide removal using renewable energy could also create a long-term supply of carbon dioxide for business activities that require it while contributing to Hawai'i's economic diversification.

Recognizing the level of effort involved, the rapid progression of federal funding activities and technology, and the likelihood of private parties conducting their own analyses, HSEO proposes three amendments to the bill that would assist with creating a development space for these technologies while still setting the table for at least one such plant to be built:

² Act 32, Sessions Law of Hawai'i 2017. https://www.capitol.hawaii.gov/session2017/bills/GM1132_PDF

³ <https://www.energy.gov/articles/doe-seeks-information-deployment-ready-carbon-reduction-and-removal-technologies>
<https://www.gsa.gov/about-us/newsroom/news-releases/gsa-doe-issue-rfi-for-technologies-that-reduce-greenhouse-gas-emissions-10132021>

1. Revise SECTION 2 of the bill, beginning on page 2, line 9, to read:

SECTION 2. The state energy office shall develop a [~~plan~~] strategy for the construction of an atmospheric carbon capture plant in the State to be constructed by 2030. The [~~plan shall~~] strategy may detail the type of construction, proposed location, estimated costs, staffing requirements, and estimated annual carbon dioxide capture rate of potential facilities.

2. Revise SECTION 3 of the bill, beginning on page 2, line 15, to read:

SECTION 3. The state energy office shall submit its [~~plan~~] strategy for the construction of an atmospheric carbon capture plant in the State by 2030, including any proposed legislation, to the legislature no later than forty days prior to the convening of the regular session of [~~2023~~] 2024, with an interim report on progress to be included in the annual report provided to the legislature prior to the convening of the regular session of 2023 in accordance with section 196-71(d), Hawai'i Revised Statutes.

3. Provide adequate funding for HSEO to carry out the required additional activities and provide matching funds that may be required for federal competitive grant applications.

HSEO supports this bill with these changes and additions, and provided that its passage does not replace or adversely impact priorities indicated in the Executive Supplemental Budget.

Thank you for the opportunity to testify.

SB-3163

Submitted on: 2/13/2022 1:03:56 PM

Testimony for EET on 2/14/2022 3:00:00 PM

Submitted By	Organization	Testifier Position	Remote Testimony Requested
Tawn Keeney	Individual	Support	Yes

Comments:

I am afraid that, upon seeing this bill, my reaction was laughter. An apology is in order to the authors, because I know that they are as highly motivated, and probably as well informed about the implications of the climate crisis as myself. The authors are probably aware that the cost of capturing and storing CO2 is now at approximately \$500 per ton and that projections are that this cost could come down to \$300/ton by 2030. Of course the cost depends on where and how one is injecting this stuff. If injecting down holes already drilled into oil reserves, which allows more oil to be pumped, the cost may be less than de novo storage into basalt. The Iceland plant removes 14,000 tons/year. I share the author’s shock at how desperate is the global warming situation in which we find ourselves.

What could bring me to laughter? I presented a ‘white paper’ to the Honolulu Climate Change Commission in November, 2020, in which it was calculated that the global warming Greenhouse Gas emissions from air transport of visitors to Hawaii in 2019 totaled **18 million tons CO2(equivalent)**. That paper as it was published in the eJournal ‘Climate Emergency Digest’ is linked here: <http://air-travel-CO2.hawaii.red> It was noted that the State total domestic emissions (all ground transportation, electricity generation and petroleum refining) for 2018 totaled 11.8 million tons CO2(e). The paper was described by Charles Fletcher PhD., Hawaii’s premier climate scientist, as a ‘very important paper’ and was recommended to be presented to the State Climate Commission.

In 2021 the most definitive study on global Greenhouse Gas emissions from aviation was published and endorsed by the IPCC in their 6th Assessment Report (Code Red For Humanity) as the standard by which to compute emissions from aviation. Using that method of calculation, the 2019 emissions from Hawaii’s visitors air transportation totaled **24 million tons CO2(e)**. This is twice the total domestic emissions from the state. The IPCC method, based on the Lee, et al. paper, “The Contribution of Global Aviation to Anthropogenic Climate Forcing”, posits a bell shaped 5% to 95% confidence interval of 14 to 36 million tons. Emissions dynamics would suggest that air transport to Hawaii would fall into the high end of the range. See Testimony prepared for the Honolulu Climate Change Commission here:

https://drive.google.com/file/d/1DvLCgMfqCV8PWOLY-aBV4_GrD6u4Ek3m/view?usp=sharing

So my laughter arises from the questions, ‘How many of Greenland’s facility would it take to capture the Carbon Dioxide that is the equivalent of the emissions from air transport of Hawaii’s tourists in a year (2019) and what would be the cost? Easy.

The CO2 equivalent emissions from air transport round trip of visitors here could be captured by 1,700 of Iceland’s air capture stations. Calculating the cost at \$300/ton of CO2 captured we arrive at a cost for capturing the greenhouse gas emissions from travel of visitors here to be over \$7 **billion** dollars yearly.

Hearing a sigh of resignation (which might have been my own) one might then think, “Well, we had better start planting trees by the millions.”

The Department of Land and Natural Resources has committed to ‘planting or protecting 100 million trees by 2030. This is certainly an ambitious goal. The US Department of Agriculture cites, with a wide distribution, that an ‘average’ mature tree sequesters about 45 pounds of CO2 yearly. So how many trees will we need to sequester the emissions in CO2(equivalents) from our visitors’ air travel. The answer is **1 Billion** trees.

This examiner testifies in support of SB3163 however with three amendments or stipulations.

1. That the Legislature requests of the Honolulu Climate Change Commission to perform a ‘formal study’ of the global warming emissions generated by visitor air travel to Hawaii.
2. That the figures arrived at by the HCCC study above be widely announced to the public of Hawaii, and particularly in reference to the sequestration potential of the proposed ‘ambient air carbon capture’ facility.
3. That the first \$60 million for study, design and construction of this and subsequent facilities be taken from the appropriations originally intended for the Hawaii Tourism Authority.

Mahalo for your consideration,

Tawn Keeney MD