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Governor

SYLVIA LUKE
Lt. Governor



SHARON HURD
Chairperson, Board of Agriculture

DEXTER KISHIDA
Deputy to the Chairperson

State of Hawai'i
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December 12, 2023

The Honorable Ronald D. Kouchi,
President and Members of the Senate
Thirty-second State Legislature
State Capitol, Room 409
Honolulu, Hawaii 96813

The Honorable Scott K. Saiki, Speaker
and Members of the House of
Representatives
Thirty-second State Legislature
State Capitol, Room 431
Honolulu, Hawaii 96813

Dear President Kouchi, Speaker Saiki, and Members of the Legislature:

For your information and consideration, I am transmitting a copy of the Annual Report on the State's Progress Toward Meeting the Milestones and Objectives of the Energy Feedstock Program as required by Act 159, SLH 2007. In accordance with Section 93-16, Hawaii Revised Statutes, I am also informing you that the report may be viewed electronically at <https://hdoa.hawaii.gov/meetings-reports/legislative-reports/>.

Sincerely,

Sharon Hurd
Chairperson, Hawaii Board of Agriculture

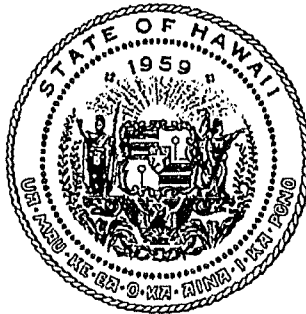
Enclosure



**REPORT TO THE THIRTY-SECOND LEGISLATURE
2024 REGULAR SESSION
STATE OF HAWAII**

**REPORT ON THE STATE'S PROGRESS TOWARD MEETING THE MILESTONES AND OBJECTIVES
OF THE ENERGY FEEDSTOCK PROGRAM**

IN RESPONSE TO ACT 159, SESSION LAWS OF HAWAII 2007



Prepared by:

**THE STATE OF HAWAII
DEPARTMENT OF AGRICULTURE**

DECEMBER 2023

ENERGY FEEDSTOCK PROGRAM

Annual Report to the Legislature for Calendar Year 2023

Legislative Background

Section 141-9, Hawaii Revised Statutes, enacted pursuant to Act 159, Session Laws of Hawaii 2007, provides in full as follows:

[§141-9] Energy feedstock program. (a) There is established within the department of agriculture an energy feedstock program that shall:

- (1) Maintain cognizance of actions taken by industry and by federal, state, county, and private agencies in activities relating to the production of energy feedstock, and promote and support worthwhile energy feedstock production activities in the State;
 - (2) Serve as an information clearinghouse for energy feedstock production activities;
 - (3) Coordinate development projects to investigate and solve biological and technical problems involved in raising selected species with commercial energy generating potential;
 - (4) Actively seek federal funding for energy feedstock production activities;
 - (5) Undertake activities required to develop and expand the energy feedstock production industry; and
 - (6) Perform other functions and activities as may be assigned by law, including monitoring the compliance provisions under section 205-4.5(a) (15).
- (b) The chairperson of the board of agriculture shall consult and coordinate with the chief energy officer of the Hawaii state energy office under chapter 196 to establish milestones and objectives for the production of energy feedstock that is grown in the State. The chairperson and the chief energy officer of the Hawaii state energy office shall report the State's progress toward meeting such milestones and objectives annually to the legislature.
- (c) The chairperson of the board of agriculture shall also consult and coordinate with research programs and activities at the University of Hawaii that will assist in the further growth and promotion of the energy feedstock production industry in Hawaii.
- (d) The chairperson of the board of agriculture may employ temporary staff exempt from chapters 76 and 89. The board may adopt rules pursuant to chapter 91 to effectuate the purposes of this section. [L 2007, c 159, §5; am L 2012, c 329, §2; am L 2019, c 122, §3]

Energy Feedstock Program Milestones and Objectives: Reportable Activities for the period of January 1, 2023-December 31, 2023.

While we currently import approximately 90% of our fuel, we also import approximately the same percentage of food. Renewable energy development in the form of energy feedstock production is anticipated to contribute to Hawaii's energy security, but its promotion should be done in a manner that

does not adversely affect access to agricultural lands by agricultural operations that contribute to Hawaii's food self-sufficiency.

It is also important to note that approvals of special use permit applications for solar energy facilities on agricultural land have been increasing over the past 14 years. While not considered "energy feedstock" solar energy facilities serve a similar purpose and are required by law to make an effort to establish "compatible agricultural activities" that, to date, have been primarily small animal livestock whose purpose is to reduce the cost of weed control.

This report is in five sections. Part 1 of the report discusses relevant legislative measures related to energy feedstock production. Part 2 discusses related research in the field of energy feedstock production. Part 3 discusses the dissemination of energy feedstock production to potential producers. Part 4 discusses actions taken by the government and industry that affect energy feedstock production. Part 5 discusses program limitations.

1. Related Legislative Measures Enacted in 2023.

There were no legislative measures enacted during the 2023 legislative session relating to energy feedstock production.

2. Related Research.

Hawaii Department of Agriculture's (HDOA) Aquaculture and Livestock Support Services branch continues to work with the Agribusiness Development Corporation (ADC), in collaboration with the United States Department of Agriculture, to identify waste streams that have feed or fertilizer potential.

On Kauai, Green Energy Team (GET) sold its 7.5MWe biomass-to-energy facility to Mahipapa (Hawaiian Electric Industries) in 2022. Mahipapa continues to harvest invasive *Albizia* trees on land managed by the ADC in Kalepa, Kauai and on other privately held lands and planted 2,000 acres of non-invasive hardwoods on the Kalepa and other lands to ensure its long-term fuel supply. Mahipapa leases 1,123 acres on Kalepa. Mahipapa has a 20 + 10-year power sales agreement with the Kauai Island Utility Cooperative (KIUC), KIUC purchases Firm, Dispatchable Capacity and energy from Mahipapa that constitutes over 16% of the County's renewable energy portfolio.

The Hawaii Natural Energy Institute continues researching pongamia seed (*Milletia pinnata*) suitability as a resource for alternative fuel production, and published findings characterizing the fuel properties of Hawaii-grown pongamia seeds and pods in April of 2021 (Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8028162>).

3. Dissemination of Energy Feedstock Information to Potential Producers

HDOA and the ADC continued to meet with individuals and companies seeking information about State- and privately-owned agricultural lands, water, and agricultural labor. Additionally, HDOA remains in contact with Pacific Biodiesel who manages biodiesel plants in Hawaii and Oregon. Pacific Biodiesel provides engineering, equipment, contracting, and laboratory services needed for profitable community-based production of quality biodiesel from various feedstocks.

4. Maintain Cognizance of Actions Taken by Government and Industry

The Energy Feedstock Program requires both the Hawaii State Energy Office (HSEO) and HDOA to “maintain cognizance of” local developments in the area of energy feedstocks and report to the Legislature.

Energy feedstock activities in Hawaii for 2023 included aviation fuel, feedstock, crop research, economic feasibility, and land suitability studies by the Hawaii Natural Energy Institute; feedstock work, fuel production, and fuel distribution by Pacific Biodiesel; use of biomass for power production by Mahipapa on Kauai; development of a facility by Aloha Carbon to convert locally-generated wastes into organic fertilizer and renewable power; continued use by Hawaii Gas of methane from the Honouliuli Wastewater Treatment Plant for use in the utility gas product delivered via pipeline on Oahu; and continued interest in oilseeds by Terviva. Since fuel production may be more cost-effective when using materials left over from the manufacture of other higher value products (food, feed, pharmaceuticals, cosmetics, etc.), it is not necessary for crops to be dedicated to energy production in order to be relevant as potential energy feedstocks.

The Hawaii Natural Energy Institute continued work on numerous alternative fuels projects, including as a member of the Federal Aviation Administration’s (FAA) Aviation Sustainability Center (ASCENT) team, conducting research on feedstocks and technologies for the production of sustainable aviation fuels (SAF). Potential feedstocks include construction and demolition waste streams, leucaena, eucalyptus, pongamia, kukui, kamani, sorghum, banagrass, jatropha, and others. Pongamia shows promise and was studied further. Technical production potentials were calculated, by island, and compared with annual jet fuel demand (as of 2018). The highest potential was (generally) from trees, with the technical SAF potential on Maui at nearly 20%; on Kauai, over 40%; Hawaii, 100%; and Oahu, less than 2%.

The only biodiesel producer in the state, Pacific Biodiesel, uses a combination of used cooking oil and oils from sustainable agricultural crops to support its annual production of nearly 6 million gallons biodiesel on Hawaii Island. In 2023, the company began a project to demonstrate biodiesel produced in Hawaii (on Kauai) from locally grown oilseed cover crops and the residue which has potential as livestock feed. This project builds upon Pacific Biodiesel’s previous research in its Hawaii Military Biofuel Crop Project (2011 to 2015). According to Pacific Biodiesel, plantings for the 2022 and 2023 harvest seasons continued year-round with regenerative farming practices including efficient center-pivot irrigation utilizing surface water, low-till practices, rotational cover cropping (to sequester carbon and improve soil health), and no herbicides or pesticides.

Pacific Biodiesel also makes its fuel available to wholesale and retail purchasers. With U.S. Department of Agriculture grant funding, Pacific Biodiesel installed several off-grid biodiesel fueling stations. With support of the Hawaii Board of Land and Natural Resources, the first station was installed at the Maalaea Harbor on Maui in June 2022, the second station was installed at Honokohau Small Boat Harbor on Hawaii Island in July 2022, and the third station was installed in Kahului, Maui in November of 2022. All of these stations offer both on-road and off-road fuel, with the harbor stations providing access for diesel powered marine vessels, including tour boats, to fuel up with local biodiesel.

A large-scale biomass-to-energy facility on Kauai was purchased from the Green Energy Team by Mahipapa, LLC, a project of Pacific Current (subsidiary of Hawaiian Electric Industries), on July 1, 2022. The facility is powered 100% by eucalyptus wood chips. According to the Energy Information Administration (EIA), in calendar year 2022 (the most recent data available), the facility used about 102,000 tons of wood to generate 52 gigawatt-hours of electricity for use by Kauai Island Utility Cooperative.

The production of electricity from waste (primarily municipal refuse derived fuel) continued at H-POWER on Oahu. According to the EIA, in calendar year 2022 (the most recent data available) the facility used over 678,000 tons to generate about 366 gigawatt-hours of electricity.

Renewable natural gas continues to be produced by Hawaii Gas at its renewable natural gas facility using biomethane from the City and County of Honolulu's Honouliuli wastewater treatment plant. Renewable natural gas produced at the facility is injected into the existing Hawaii Gas pipeline and mixed with synthetic natural gas, produced from petroleum by-product naphtha, to serve Hawaii Gas customers. According to the annual report filed by Hawaii Gas, "In 2022, Hawaii Gas upgraded 288,734 therms of biogas to biomethane from the Honouliuli WWTP Biogas Project. Hawaii Gas and the City & County of Honolulu are also in the process of extending the contract from December 31, 2024 to December 31, 2034." A contract extension would be subject to approval by the Public Utilities Commission.

Aloha Carbon reported progress on their project to convert several types of organic wastes (invasive species biomass from landscape restoration and fire break activities, landscaping and tree trimming waste, wood from construction and demolition) into gasification-compatible feedstock, to make energy and products such as organic fertilizer in a Sustainable Materials Recovery & Fertilizer Facility. This builds upon a previous award of a Federal Small Business Innovation Research Grant to the company to gasify biomass waste into green hydrogen and sustainable aviation fuel.

Although not energy feedstock per se, in May, 2023, Par Hawaii received approval from the U.S. Department of Commerce to use renewable feedstocks to produce renewable fuels, to include renewable diesel, sustainable aviation fuel, and naphtha, at the refinery. In previous discussions with HDOA, Par Hawaii indicated an interest in growing feedstock in Hawaii to be processed into renewable fuels at their refinery.

In addition, many other projects and discussions occurred regarding crops and wastes that could be directed to the production of energy; and interest continued in forest biomass, soil carbon, and carbon sequestration.

5. Program Limitations

Monitoring

HDOA does have staff experienced in land use permit review that will be used to evaluate applications for biofuel processing facilities and agricultural-energy facilities and their respective appurtenances as currently permitted on lands within the Agricultural District. HDOA is on the alert for policies, projects, and programs, including subsidies, that support growing energy feedstock on currently productive or potentially productive agricultural lands in Hawaii and to include impact analyses of the effect this competition for agricultural land will have on the State's priorities to increase food self-sufficiency.

Staffing

While the Energy Feedstock Program was authorized to employ temporary staff, the Legislature did not provide any funding for the positions in FY 08 or subsequent years. As a result, HDOA has focused its efforts on maintaining an awareness of actions taken by government and industry and supporting the efforts and activities of the HSEO, and meeting with organizations interested in growing feedstock for processing into biofuel on agricultural land. HDOA is especially interested in developments in by-products from biofuel production that can be used to replace imported animal and fish feed and fertilizer. Pacific Biodiesel has been extremely helpful and collaborative in this area.

Grant Writing

No federal grants were sought during the reporting period due to lack of funding for staff.