

DAVID Y. IGE
Governor

JOSH GREEN
Lt. Governor



PHYLLIS SHIMABUKURO-GEISER
Chairperson, Board of Agriculture

DEPT. COMM. NO. 262
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December 30, 2021

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

The Honorable Scott K. Saiki, Speaker
and Members of the House of
Representatives
Thirty-first 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 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,

A handwritten signature in cursive script that reads "Phyllis Shimabukuro-Geiser".

Phyllis Shimabukuro-Geiser
Chairperson, Board of Agriculture

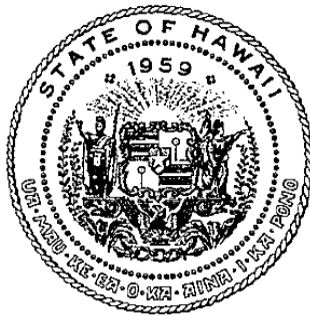
Enclosures



**REPORT TO THE THIRTY-FIRST LEGISLATURE
2022 REGULAR SESSION
STATE OF HAWAII**

**REPORT ON THE STATE 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 2021

ENERGY FEEDSTOCK PROGRAM

Annual Report to the Legislature for Calendar Year 2021

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 energy resources coordinator under chapter 196 to establish milestones and objectives for the production of energy feedstock that is grown in the State. The chairperson and the coordinator 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]

Energy Feedstock Program Milestones and Objectives: Reportable Activities for the period of January 1, 2020-December 31, 2020.

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 essential to Hawaii's energy security, but it should be promoted in a manner that protects the prime agricultural land that is fundamental to agricultural production and food security. Farmers in general will benefit when a locally produced fuel source is available so that they are less subject to fluctuation of world oil prices and the impact it has on petroleum-based inputs.

It is also important to note that special use permits for solar energy facilities on land designated as “agriculture” have been increasing over the past several years. While not considered “energy feedstock” solar energy facilities serve a similar purpose; however, solar energy facilities cannot easily be converted to food production. For the purposes of this report, solar energy legislation will also be included as a part of the discussion.

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 affects energy feedstock production. Part 5 discusses program limitations.

1. Related Legislative Measures Enacted in 2021.

Act 75. Allocates three cents of the barrel tax to fund the installation of electric vehicle (EV) charging systems. Establishes a subaccount in the public utilities commission special fund for the EV charging system rebate program. Reallocates a portion of the environmental response, energy, and food security tax to be deposited into the subaccount. Appropriates funds out of the energy security special fund for the EV charging system rebate program. Authorizes each county to adopt ordinances to enforce section 291-71, Hawaii Revised Statutes, including the establishment of penalties for failure to comply with its requirements or make reasonable efforts to maintain EV charging systems in working order. Establishes penalties for parking any vehicle in a parking space equipped with an electric vehicle charging system while not actively charging. Requires new EV charging systems installed pursuant to the EV charging system requirement to be at least Level 2 and network-capable beginning 1/1/2022. Clarifies that certain enforcement officers may enter private property to enforce EV parking space violations. (CD1)

Act 82. Requires the public utilities commission to determine whether analysis of the effect of the State's reliance on fossil fuels is necessary for proceedings involving water, wastewater, or telecommunications providers on an individual basis. Provides that the analysis is not required for a utility's routine system replacements or determinations that do not pertain to capital improvements or operations. (CD1)

Act 92. Requires the Hawaii natural energy institute, in consultation with the department of health, to conduct a comprehensive study to determine best practices for disposal, recycling, or secondary use of clean energy products in the State. (CD1)

Act 107. Establishes the clean energy and energy efficiency revolving loan fund. Repeals the building energy efficiency revolving loan fund. Authorizes moneys in the green infrastructure special fund to be used to finance the option to purchase solar energy systems and other clean energy equipment, including the purchase or lease of electric vehicles. Clarifies the definitions of loan program and green infrastructure loans as they relate to the issuance of GEMS bonds. Appropriates an unspecified amount out of the clean energy and energy efficiency revolving loan fund. Appropriates funds to provide loans or other financial assistance to eligible borrowers for clean energy investments. (CD1)

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.

The ADC received \$4.5 million from the Legislature for a zero-waste conversion project in Keaau, Hawaii to develop a demonstration facility where researchers will use heterotrophic algae/fungi to convert papaya waste into oil and feed products. It is estimated that the Hawaii papaya industry produces approximately 15 million pounds of papaya annually that cannot be sold as fresh produce because of blemishes and other deformities and insect infestations.

Upon completion, this facility would provide farmers with the opportunity to earn additional income from the waste portions of their crops in the form of feedstock, which can be converted into oil for fuel and high protein feed for livestock. More importantly, the research on the zero- waste concept will be able to continue and could potentially be applied to other fruit and vegetable crops across the state.

To expedite the development and research, ADC entered in a Memorandum of Understanding with Pacific Biodiesel Technologies ("PBT") to establish a temporary demonstration facility at PBT's Big Island Biodiesel site where the specialized equipment is currently being modified and assembled. To date, the ADC has begun preliminary test trials on the equipment at the Big Island Biodiesel site. A total of \$3 million was expended to purchase the equipment; acquire a 1.5-acre parcel of land in the W.H. Shipman Business Park and complete the plans and design of the Zero Waste Facility. The ADC put out a solicitation on the State Procurement Office's HlePRO website for the construction phase and was unable to obtain any bids. As a result, the remaining \$1.5 million that was allotted for the construction of the Zero Waste Facility lapsed on June 30, 2018. Additional CIP funding was requested; however, no additional funding has been appropriated to date.

On Kauai, Green Energy Team (GET) continues operating its 7.5MWe biomass to energy facility. GET has harvested over 2,400 acres of invasive *Albizia* trees on land managed by the Agribusiness Development Corporation 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. GET leases 1,123 acres on Kalepa. GET has a 20 + 10-year power sales agreement with the Kauai Island Utility Cooperative (KIUC), KIUC purchases Firm, Dispatchable Capacity and energy from GET to and constitutes over 16% of the County's renewable energy portfolio.

The Hawaii Natural Energy Institute continues to conduct research into pongamia seeds' (*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 its attached agency, the Agribusiness Development Corporation, continue to meet with individuals and companies seeking information about state or privately owned agricultural-zoned lands, water, and agricultural labor. Additionally, HDOA remains in contact with Pacific Biodiesel. Pacific Biodiesel 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

Hawaii Clean Energy Initiative

HDOA is a member of the Hawaii Clean Energy Initiative (HCEI), which is a partnership between the Department of Energy and the State of Hawaii and is part of the Fuels working group. In addition to the Fuels group, there are three other working groups addressing End-Use Efficiency, Electricity, and Transportation. These groups have met separately and together since 2008. Collectively, these four groups are tasked with:

- Benchmarking the current state of clean energy in Hawaii
- Identifying information gaps
- Identifying structural and technical barriers to reaching the 100% clean energy goal
- Developing strategies for overcoming the barriers.

Oceanic Institute Feed Mill

On February 1, 2013, HDOA entered into a contract with Oceanic Institute (OI) to construct a pilot production scale research feed mill. Guided by Act 122, Session Laws of Hawaii 2013, HDOA set aside \$450,000 in special funds and general revenues for OI to plan, design, and construct a feed mill laboratory. The feed mill laboratory will house a Wenger X-20 extruder, an Insta Pro model 2500 dry extruder, and a CPM model 1100 pellet mill.

The objectives behind the pilot research feed mill are to:

- Construct a pilot production scale research feed mill to support allied research and development programs at OI and other U.S. aquaculture and terrestrial entities.
- Develop research feeds in cooperation with allied research and development programs at the Institute that effectively and efficiently meet all animal nutritional requirements and research objectives.
- Offer large-scale defined test feeds for genetic and nutritional improvement research programs, pharmaceutical testing for commercial viability and efficacy, equipment testing, and efficiency of different manufacturing processes.
- Provide research feed products and technical assistance to support large-scale research farm grow-out trials with shrimp and finfish that simulate commercial production conditions.
- Demonstrate, promote, and display U.S. feed milling technology, goods, and services— such as those developed by members of the American Feed Industry Association— to the countries of the Pacific Basin.
- Assist in market development and increasing the demand for American feed commodities, manufacturing equipment, computer software, and other products that support aquatic feeds production.
- Initiate an international training program that offers short courses in aquaculture feed processing technology by working in cooperation with universities, private research

organizations, and commercial companies. A Memorandum of Understanding is already in place with University of Hawai'i at Hilo for educational activities with terrestrial animals. OI would like to develop a similar partnership with Hawai'i Pacific University for aquatic animals.

- Transfer feed mill processing technologies to the commercial sector once they are proven effective and commercially viable.

Oceanic Institute is currently working with a non-profit organization on Hawaii Island to operate the feed mill and is interested in processing gorse (an invasive plant) into livestock feed. The nonprofit partner has received a limited right of entry to harvest gorse from the slopes of Mauna Kea. Subject to funding availability, the feed mill plans to begin processing the gorse. The operational status of the feed mill has been impacted by COVID-19-related travel restrictions, but Oceanic Institute has plans to resume full operations in conjunction with the nonprofit partner.

Pacific Biodiesel

Pacific Biodiesel continues to strive for 100% local feedstock to support its annual production of 5.5 million gallons of premium distilled biodiesel at its refinery on Hawaii Island. In addition to recycling used cooking oil from restaurants statewide, the company is increasingly focused on sustainable agriculture to farm for "food then fuel" to support energy security and food security in Hawaii.

Pacific Biodiesel's founders Bob and Kelly King continued their agriculture operation on 115 acres in Maui's central valley. The primary crop was sunflower. Other crops planted in 2021 include cow peas (future swine feed opportunity), sunn hemp (*crotalaria juncea*), rye, buckwheat, and clover. Plantings for the 2021 harvest season continued year-round with regenerative farming practices including efficient pivot irrigation, no till practices and rotational cover cropping to help sequester carbon and improve soil health. No herbicides or pesticides have been used on any of the crops. All farm equipment and electrical power operates on 100% biodiesel, produced by Pacific Biodiesel.

The sunflower seeds are harvested on Maui then shipped to the company's crushing mill in Keaau, Hawaii Island. There, the seeds are carefully expeller pressed to maintain high quality, without chemical refining, and continue to be sold as cosmetic oil and food-grade oil in the Hawaii market. The wholesale market for the company's premium culinary oils has not yet fully rebounded from the effects of the pandemic, although consumer sales of the culinary oils saw a boost with an increased awareness of supporting local farmers and local food products. Residual and off specification crop oil is being recycled and processed biodiesel.

The sunflower crop continues to generate public excitement when the sunflowers are in bloom; however, educational farm tours for customers and community groups interested in learning about Pacific Biodiesel and its sustainable farming, recycling, and clean fuel operation in Hawaii continued to be curtailed in 2021 due to the pandemic.

The founders of Pacific Biodiesel continued producing cosmetic-grade full spectrum hemp extract made from industrial hemp farmed by their company on Maui for sale to the local and mainland cosmetic manufacturing markets. However, demand remained below expectations as the CBD is regulated by the US FDA and the State DOH. Many potential products are still banned in Hawaii. The hemp plants are grown on soil remediated by sunflowers farmed on the site since 2017. The premium extract is

produced using a supercritical CO2 extractor; the crude extract is blended (per FDA requirements not to exceed 0.3% THC) with macadamia and sunflower oils also produced by the company.

In 2021, Pacific Biodiesel received USDA grant funding to produce a series of innovative mobile biodiesel fueling stations to help expand availability of its 100% biodiesel to serve customers statewide.

The Board of Land and Natural Resources (BLNR) approved at its meeting in August 2021 a Revocable Permit (RP) for Pacific Biodiesel to install one of its mobile biodiesel fueling stations at Ma'alaea Harbor on Maui. The station is flexible and is able to serve marine customers, including tour boats, as well as on-road vehicles.

5. Program Limitations

Monitoring

Expertise in biofuel processing facilities and appurtenances is not currently available within the Department. Without funds to hire staff or to contract for services, HDOA will be unable to monitor the compliance provisions under Section 205-4.5(a) (16).

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 DBEDT, working with the U.S. Navy and U.S.D.A. as they implement their Memorandum of Understanding to jointly develop biofuels, and actively participated in discussions and conferences held in 2014 to advance biofuel production in Hawaii. The Chairperson continues to meet with various companies interested in using agricultural lands and water resources for biofuel production. 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.