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Governor

JOSH GREEN
Lt. Governor



PHYLLIS SHIMABUKURO-GEISER
Chairperson, Board of Agriculture

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December 26, 2019

The Honorable Ronald D. Kouchi,
President and Member of the Senate
Thirtieth State Legislature
State Capitol, Room 409
Honolulu, HI 96813

The Honorable Scott K. Saiki,
Speaker and Member of the House of
Representatives
Thirtieth State Legislature
State Capitol, Room 431
Honolulu, HI 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 <http://hdoa.hawaii.gov/>.

Sincerely,

Phyllis Shimabukuro-Geiser, Chairperson
Board of Agriculture

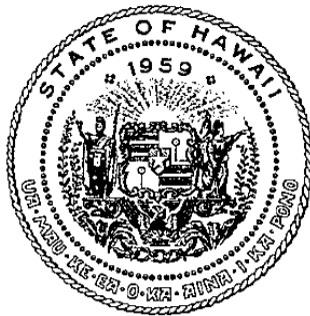
Enclosures



**REPORT TO THE THIRTIETH LEGISLATURE
2020 REGULAR SESSION
STATE OF HAWAII**

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

ACT 159, SESSION LAWS OF HAWAII 2007



Prepared by:

**THE STATE OF HAWAII
DEPARTMENT OF AGRICULTURE**

DECEMBER 2019

ENERGY FEEDSTOCK PROGRAM

Annual Report to the Legislature for Calendar Year 2017

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, 2017-December 31, 2017.

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.

It is critical that all of agriculture work together. We have common interests in seeing agricultural lands protected and particularly lands designated as Important Agricultural Lands; in the fair and equitable use of water and to have this fairness reflected in the water code; in increasing the number and productivity of farmers by strengthening the agricultural education programs in public and private schools, and in addressing the challenging issue of farm labor.

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 2019.

Act 52. Authorizes the issuance of special purpose revenue bonds to assist Trevi Systems, Inc., or its related entity, Kona Coast Water LLC, to fund the planning, designing, construction, equipping, land leases, and other assets for two or more plants to desalinate water using one hundred per cent renewable solar energy and supply it to customers on Hawaii island and potentially on other islands as well. (SB 1440 SD1 HD1 CD1)

Act 92. Permits the Department of Business, Economic Development, and Tourism to share energy data with the Department of Health for purposes of regulating greenhouse gas emissions. (SB 1241 SD1 HD1 CD1)

Act 122. Establishes the Hawaii State Energy Office and Chief Energy Officer position in Department of Business, Economic Development, and Tourism (DBEDT). Repeals Director of DBEDT's function as Energy Resources Coordinator and Renewable Energy Facilitator. Transfers Coordinator, Facilitator, and existing DBEDT energy office employees and functions to the Office. Amends allowable uses and funding amount of the Energy Security Special Fund. Appropriates operating funds and establishes position ceilings for the Office. Appropriates funds for a carbon pricing study. (HB 852 HD1 SD1 CD1)

Act 141. Requires the department of business, economic development, and tourism to adopt minimum appliance efficiency standards for certain products sold or installed in the State that

are substantially equivalent to existing appliance efficiency standards established in California and by the federal government. (HB 556 HD1 SD2 CD1)

Act 144. Requires all public agencies to identify and evaluate vehicle fleet energy efficiency programs to be implemented using vehicle fleet performance contracts, whereby the agencies may contract for the provision of vehicles or associated capital investments in charging or fueling infrastructure and apply vehicle fleet operational and fuel cost savings toward the cost. Amends the definition of "energy performance contract" to include the provision of electric vehicle charging infrastructure for a portion of avoided vehicle maintenance or fuel costs pursuant to a vehicle fleet energy efficiency program. (HB 401 HD1 SD2 CD1)

Act 145. Requires UH community colleges to establish energy systems and technology training courses for county officers and employees responsible for permitting, inspecting, licensing, and approving construction projects and an advisory committee of industry stakeholders and to submit a report to the Legislature. Appropriates funds. (HB 560 HD1 SD1 CD1)

Act 160. Authorizes the issuance of special purpose revenue bonds to Mele Associates, Inc., a renewable energy developer, for the provision of electric energy and installation of renewable energy projects in Hawaii. (SB 988 SD1 HD2)

Act 243. Clarifies the conditions under which condominium unit owners can install solar energy devices. Amends the definition of "solar energy devices" to include building-applied and building-integrated photovoltaics and to exclude passive solar skylights and windows. (SB 272 HD2 CD1)

2. Related Research.

Hawaii Department of Agriculture

HDOA's Aquaculture and Livestock Support Services branch is working 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 a total of \$4.5 million from the Legislature for the 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 will 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.

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 insure 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 cover 12% of the Kauai’s base load.

3. Dissemination of Energy Feedstock Information to Potential Producers

HDOA and its attached agency, the Agribusiness Development Corporation, continues to meet with individuals and companies seeking information about state or privately owned agricultural-zoned lands, water, and agricultural labor. During 2018, HDOA has met with several companies and individuals interested in producing feedstock.

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 throughout the year. 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 70% 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.

As of December 2018, the feed mill is operational.

Pacific Biodiesel

Pacific Biodiesel Technologies continued its agriculture operations in 2019, focusing its farming on 115 acres in Maui's central valley. The primary crop was sunflower, which has shown promising results from the agronomy aspect. Plantings for the 2019 harvest season continued year-round, made more efficient by an above ground center pivot irrigation system installed during the summer (the nearly quarter-mile-long system pivots on a center pole powered by the company's biodiesel generator, enabling irrigation of up to 75 acres compared to only 10+ acres previously utilizing reel gun irrigation). No herbicides or pesticides have been used on any of the crops. 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. Residual and off spec crop oil is being recycled for the production of biodiesel.

The sunflower crop in particular continues to generate public excitement when the sunflowers are in bloom; the company has hosted dozens of educational farm tours for customer and community groups interested in learning about Pacific Biodiesel and its sustainable farming, recycling, and clean fuel operation in Hawaii.

In 2019, the founders of Pacific Biodiesel received Maui's first HDOA state license to farm industrial hemp on 10 acres. Hemp has exciting potential for its flexibility as fuel, food, fiber and other high-end co-products. Situated within the company's 115 acre farm site, the hemp farming operation will initially focus on flower (resin) cultivars of industrial hemp (characterized by high cannabinoid content) for the production of full-spectrum hemp extract including CBD that will be sold as a natural ingredient to cosmetic producers in Hawaii and on the mainland. The hemp plants will be grown on soil remediated by sunflowers farmed on the site since 2017. The premium extract will be produced using a supercritical CO2 extractor; the crude extract will be blended (per FDA requirements not to exceed 0.3% THC) with macadamia and sunflower oils also produced by the company.

With significant market demand for premium hemp-derived CBD, the farming operation in 2020 will primarily focus on this new Maui-grown product. Other crops planned for the 2020 season include trials of new varieties of sunflower as well as safflower, chickpeas, and cover crop trials including cow peas, sun hemp, rye, and vetch mix.

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 participating in discussions and conferences held in 2014 to advance biofuel production in Hawaii. The Chairperson continues to meet with various companies interested in using state 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.