

CARLSMITH BALL LLP

STEVEN M. EGESDAL 4511-0  
JENNIFER A. LIM 8357-0  
ASB Tower, Suite 2100  
1001 Bishop Street  
Honolulu, HI 96813  
Tel No. 808.523.2500  
Fax No. 808.523.0842

Attorneys for Intervenor  
SMB II LLC

BEFORE THE LAND USE COMMISSION  
OF THE STATE OF HAWAII

LAND USE COMMISSION  
STATE OF HAWAII  
2016 MAR 17 P 1:34

**In the Matter of the Petition**

To Issue a Declaratory Order That a  
Photovoltaic System is Not an  
Agricultural Energy Facility.

**DOCKET NO. DR16-55**

**SMB II LLC'S PETITION TO  
INTERVENE; MEMORANDUM IN  
SUPPORT OF PETITION; EXHIBIT 1;  
CERTIFICATE OF SERVICE**

**SMB II LLC'S PETITION TO INTERVENE**

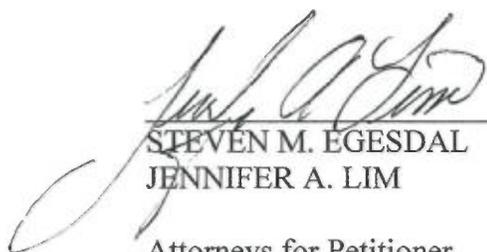
TO THE HONORABLE LAND USE COMMISSION OF THE STATE OF HAWAII:

SMB II LLC, a Hawai'i limited liability company ("**SMB**"), petitions the Land Use Commission of the State of Hawai'i (the "**Commission**") for an order allowing SMB to intervene as a party in this proceeding under Hawai'i Revised Statutes ("**HRS**") chs. 91 and 205 and under Hawai'i Administrative Rules ("**HAR**") § § 15-15-52, 15-15-53, and Subchapter 14 (HAR § § 15-15-98 *et seq.*). SMB has an interest in the property and the land use permits that are the subject of this proceeding and therefore should be allowed to intervene.

Under HAR § 15-15-52(k), the denial of a petition to intervene must be appealed to circuit court under HRS § 91-14. HRS § 91-14 sets forth rights for judicial review of contested cases. A contested case is a proceeding in which legal rights, duties, or privileges of specific parties are required by law to be determined after an opportunity for agency hearing. HRS § 91-1(5).

In their Petition for Declaratory Order; Memorandum in Support of Petition for Declaratory Order; Exhibits 1 - 5, filed with the Commission on February 8, 2016 (the "OP/DOA Petition"), the Office of Planning, State of Hawai'i ("OP"), and the State Department of Agriculture ("DOA"), did not request a hearing on the OP/DOA Petition. SMB respectfully submits that the Commission *must* hold a hearing on SMB's Petition to Intervene because such hearing is required by agency rule, and is also required by statute and as a matter of constitutional due process. In addition, SMB asserts that this Petition to Intervene is being brought in response to the OP/DOA Petition, and SMB affirmatively requests that all proceedings in this Docket be conducted in the context of a hearing before the Commission under HAR § 15-15-103 and Chapter 91, HRS.

DATED: Honolulu, Hawai'i, March 17, 2016.



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STEVEN M. EGESDAL  
JENNIFER A. LIM  
Attorneys for Petitioner  
SMB II LLC

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**SMB II LLC'S MEMORANDUM IN  
SUPPORT OF PETITION**

**SMB II LLC'S MEMORANDUM IN SUPPORT OF PETITION**

SMB hereby petitions this honorable State of Hawai'i Land Use Commission ("**Commission**") to grant SMB the right to intervene in the matter of the Petition for Declaratory Order filed in this Docket on February 8, 2016.

**I. BACKGROUND**

On January 8, 2016, the Director ("**Planning Director**") of the Department of Planning and Permitting of the City and County of Honolulu ("**DPP**") issued a Conditional Use Permit (minor) and Zoning Waiver permit to allow for the development of SMB's agricultural energy facility (the "**Permits**") within a 2-acre portion of that certain property located at Tax Map Key No. (1) 8-5-019: 014, situate at Waianae, City and County of Honolulu, Island of Oahu ("**Property**"). To issue the Permits, the Planning Director had to first determine that SMB's project qualified as an agricultural energy facility under HRS § 205-4.5(a)(17) ("**AEF**").

On February 8, 2016, OP and DOA jointly filed with this Commission a Petition for Declaratory Order; Memorandum in Support of Petition for Declaratory Order; Exhibits 1 - 5 ("**OP/DOA Petition**"). A copy of the approved Permits was filed as OP/DOA Exhibit 1.

Under HRS § 205-4.5(a)(17), an AEF is defined as follows:

Agricultural-energy facilities, including appurtenances necessary for an agricultural-energy enterprise; provided that the primary activity of the agricultural-energy enterprise is agricultural activity. To be considered the primary activity of an agricultural-energy enterprise, the total acreage devoted to agricultural activity

shall be not less than ninety per cent of the total acreage of the agricultural-energy enterprise. The agricultural-energy facility shall be limited to lands owned, leased, licensed, or operated by the entity conducting the agricultural activity.

As used in this paragraph:

"Agricultural activity" means any activity described in paragraphs (1) to (3) of this subsection [*i.e., under HRS § 205-4.5(a)(1) - (3), as follows: (1) Cultivation of crops, including crops for bioenergy, flowers, vegetables, foliage, fruits, forage, and timber; (2) Game and fish propagation; (3) Raising of livestock, including poultry, bees, fish, or other animal or aquatic life that are propagated for economic or personal use*].

"Agricultural-energy enterprise" means an enterprise that integrally incorporates an agricultural activity with an agricultural-energy facility.

"Agricultural-energy facility" means a facility that generates, stores, or **distributes renewable energy as defined in section 269-91** [*"renewable energy" is defined in HRS § 269-91 as follows: **"Renewable energy' means energy generated or produced using the following sources: (1) Wind; (2) The sun; (3) Falling water; (4) Biogas, including landfill and sewage-based digester gas; (5) Geothermal; (6) Ocean water, currents, and waves, including ocean thermal energy conversion; (7) Biomass, including biomass crops, agricultural and animal residues and wastes, and municipal solid waste and other solid waste; (8) Biofuels; and (9) Hydrogen produced from renewable energy sources.**"*] or renewable fuel including electrical or thermal energy or liquid or gaseous fuels from products of agricultural activities from agricultural lands located in the State.

"Appurtenances" means operational infrastructure of the appropriate type and scale for the economic commercial generation, storage, distribution, and other similar handling of energy, including equipment, feedstock, fuels, and other products of agricultural-energy facilities;

HRS § 205-4.5(a)(17)(emphasis added).

Notwithstanding the statutory definition of an AEF, OP/DOA ask this Commission to determine that an AEF "must be a facility that generates, stores, or distributes (1) renewable energy from products of agricultural activities, or (2) renewable fuel from provides of

agricultural activities." OP/DOA Petition at 9. In other words, OP/DOA asks this Commission to disregard the explicit incorporation of HRS § 269-1 and the statutory definition of "renewable energy."

OP/DOA is wrong. When the Hawai'i State Legislature enacted Act 145 in 2008, it very deliberately incorporated the definition of renewable energy under HRS § 269-91 into the statute.<sup>1</sup> OP submitted no testimony to the Legislature regarding that change in 2008, and it appears that the change was made, at least in part, based upon testimony submitted by the DOA expressing concerns that the earlier versions of the Bill could have had "the effect of inadvertently excluding similar but not the same agriculture-based renewable energy concepts from consideration as permissible uses." Attached hereto as **SMB Exhibit 1** is a letter to OP/DOA dated February 3, 2016, with six enclosures, detailing that legislative history and other matters.<sup>2</sup>

SMB asserts that OP/DOA lacks legal standing to file the OP/DOA Petition. For that reason, and others, this Commission has no jurisdiction to consider the OP/DOA Petition, and therefore must dismiss or deny the OP/DOA Petition. SMB will present those arguments to the Commission under a separate Statement of Position/Motion to Dismiss to be filed shortly. As a preliminary matter, however, SMB formally requests that the Commission grant SMB's Petition to Intervene.

## **II. STANDARDS FOR INTERVENTION**

The standard by which the Commission must grant intervention is set forth in HRS § 205-4(e)(3):

All persons who have some property interest in the land, who lawfully reside on the land, or who otherwise can demonstrate that

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<sup>1</sup> Act 145 was initially presented as SB 2849, modified by SD1 on Feb. 29, 2008, and further modified by HD1 on March 1, 2008, and finally by CD1. HRS § 269-91 was incorporated into HD1, and remained in CD1, which was enacted into law as Act 145.

<sup>2</sup> Enclosed with the letter are copies of: (i) Act 145 (2008); (ii) Testimony from the DOA dated March 18, 2008; (iii) Testimony from OP dated March 18 and 24, 2008; (iv) Standing Committee Report dated March 20, 2008 by Committee on Energy & Environmental Protection; (v) 2008 House Journal (59th Day), page 885; and (vi) Agricultural Plan for the AEF at 85-485 Waianae Valley Road, Waianae, Oahu, including reports and pamphlets regarding agrivoltaic systems.

they will be so directly and immediately affected by the proposed change that their interest in the proceeding is clearly distinguishable from that of the general public *shall* be admitted as parties upon timely application for intervention.

The Commission's rule under HAR § 15-15-52(c) is substantially similar.<sup>3</sup>

The Permits that OP/DOA belatedly seek to attack through the OP/DOA Petition were issued to SMB, to allow for the establishment of an AEF at the Property. SMB has a lease from the fee owners of the Property, Janet Gaza, Trustee of the Janet S.L. Gaza Trust, and Kenneth S. Gaza, which allows SMB to operate the AEF at the Property. Janet and Kenneth Gaza provided fee owner authorization to allow SMB to submit applications to the Department of Planning and Permitting for the Permits.

SMB has some "property interest" in the land that is the subject of the OP/DOA Petition, and consequently, a right to intervene in this matter. The OP/DOA Petition explicitly attacks the Permits issued to SMB for its operations at the Property. The OP/DOA Petition included as exhibits: (i) a copy of the Permits, (ii) emails between OP, DOA and DPP staff regarding the Permits (including inquires as to the Commission's interpretation on this matter), and (iii) a detailed project description prepared by counsel and submitted to DPP prior to the submission of the applications for the Permits.

There is no question that the OP/DOA Petition seeks to challenge the Permits. There is no question that SMB, who holds the Permits and a lease over the Property, "will be so directly and immediately affected by the proposed change that their interest in the proceeding is clearly distinguishable from that of the general public." As such, the Commission must grant SMB's request to intervene in this matter.

### **III. FILING REQUIREMENTS FOR INTERVENTION**

SMB petitions for intervention under HAR § 15-15-53. That rule applies to proceedings other than a district boundary amendment proceeding and special permit proceedings. HAR § 15-15-53 requires petitions to intervene to conform to subchapter 5 of the Commission's Rules,

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<sup>3</sup> "All persons who have a property interest in the land, or who otherwise can demonstrate that they will be so directly and immediately affected by the proposed change that their interest in the proceeding is clearly distinguishable from that of the general public."

and HAR §§15-15-52(e) and (f).

In addition to filing copies and service requirements, HAR § 15-15-52(e) provides a deadline for filing, which deadline is triggered by the publication of a notice of hearing. This petition meets the applicable requirements of subchapter 5 and HAR §15-15-52(e). As no notice of hearing has been published, and neither the LUC's rules nor Chapter 205, HRS, address the publication of a notice of hearing for matters other than boundary amendment proceedings, this petition is timely.

The LUC's rules require that petitions to intervene refer to the following:

- (1) Nature of the petitioner's statutory or other right;
- (2) Nature and extent of the petitioner's interest in the matter, and if an abutting property owner, the tax map key description of the property; and
- (3) Effect of any decision in the proceeding on the petitioner's interest.

HAR § 15-15-52(f).<sup>4</sup>

**A. NATURE OF SMB'S RIGHT TO INTERVENE.**

SMB also holds a lease over the Property for which the Permits were issued. The purpose of the lease is to allow SMB to operate the AEF that was authorized by the Permits. SMB has a statutory right to intervene in this proceeding before the Commission.

The due process clauses of the Hawai'i and United States Constitutions hold that, "[n]o person shall be deprived of life, liberty, or property without due process of law." Haw. Const. art. I, § 5; U.S. Const. amend. XIV, § 1. "The basic elements of due process of law require notice and an opportunity to be heard at a meaningful time and in a meaningful manner." *Price v. Zoning Bd. of Appeals of Honolulu*, 77 Haw. 168, 172, 883 P.2d 629, 633 (1994). Because SMB has a property interest in the land identified in the OP/DOA Petition, SMB must have an opportunity to be heard at a meaningful time and in a meaningful manner.

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<sup>4</sup> HAR § 15-15-53(b) provides that "[c]ontents of the petition shall conform to sections 15-15-52(e) and 15-15-52(f)."

**B. NATURE OF SMB'S INTEREST IN THE MATTER.**

As stated above, SMB holds the Permits that OP/DOA belatedly attempt to attack through this declaratory order proceeding. The Permits issued to SMB are the subject of the OP/DOA Petition. SMB has an interest in the outcome of this matter.

The Permits were issued to SMB. SMB is the proposed developer of the AEF and is under contract with Hawaiian Electric Company pursuant to its Feed-In-Tariff program to provide the renewable energy. SMB has made arrangements with the farmer who will be operating the agricultural activities at the 2-acre AEF, Mr. Victor Bhatti, President of Betel Garden, LLC. A copy of Mr. Bhatti's Agricultural Plan is included with SMB Ex. 1.

**C. EFFECT OF A COMMISSION DECISION ON SMB'S INTEREST.**

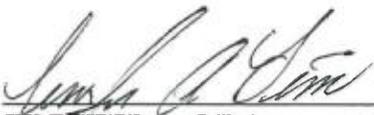
It is unlikely that the Commission's decision on the OP/DOA Petition could affect SMB's interest in the Permits. The Permits were issued by the Planning Director a month before the OP/DOA Petition was filed. The sole means of challenging the Permits is through the appeal process provided by the Honolulu Zoning Board of Appeals. Therefore the Commission's decision in this Docket should have no effect on the validity of the Permits. In that respect, SMB requests intervention as a special appearance to contest jurisdiction and seek dismissal of the OP/DOA Petition, and SMB does so with a full reservation of all of its rights.

Nevertheless, because of SMB's particular perspective as the holder of the Permits, SMB's intervention will help to develop a sound record, and provide an opportunity to correct the glaring errors and misleading argument in the OP/DOA Petition.

**IV. CONCLUSION**

For the reasons stated herein, SMB respectfully requests that the Commission grant this petition and allow SMB to intervene as a party to the declaratory order proceedings brought by OP/DOA in this Docket DR16-55.

DATED: Honolulu, Hawai'i, March 17, 2016.

  
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JENNIFER A. LIM  
STEVEN M. EGESDAL  
Attorneys for Intervenor  
SMB II LLC

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**DOCKET NO. DR16-55**

**CERTIFICATE OF SERVICE**

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the foregoing Petition was duly served upon the follow parties by hand-delivering a copy of same on March 17, 2016:

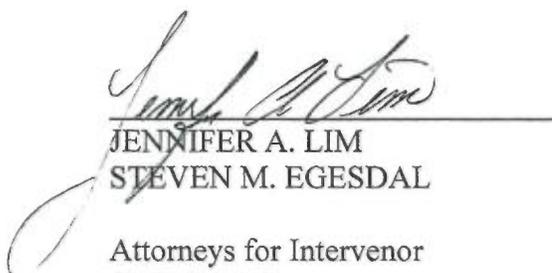
DOUGLAS S. CHIN, ESQ.  
Attorney General  
BRYAN C. YEE, ESQ.  
Deputy Attorney General  
Department of the Attorney General  
425 Queen Street  
Honolulu, HI 96813

Attorneys for Office of Planning and  
State of Hawai'i, Department of Agriculture

DEPARTMENT OF PLANNING AND PERMITTING  
City and County of Honolulu  
650 S. King Street, 7th Floor  
Honolulu, HI 96813

RICHARD D. LEWALLEN, ESQ.  
Department of Corporation Counsel  
Honolulu Hale  
530 S. King Street, Room 110  
Honolulu, HI 96813

DATED: Honolulu, Hawai'i, March 17, 2016.



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JENNIFER A. LIM  
STEVEN M. EGESDAL

Attorneys for Intervenor  
SMB II LLC

# CARLSMITH BALL LLP

A LIMITED LIABILITY LAW PARTNERSHIP

ASB TOWER, SUITE 2100  
1001 BISHOP STREET  
HONOLULU, HAWAII 96813  
TELEPHONE 808.523.2500 FAX 808.523.0842  
WWW.CARLSMITH.COM

DIRECT DIAL NO.  
808.523.2557

JLIM@CARLSMITH.COM

OUR REFERENCE NO.:  
067811-00001

February 3, 2016

Scott E. Enright, Chairperson,  
State of Hawaii Department of Agriculture  
Via E-Mail: Scott.Enright@hawaii.gov

Leo R. Asuncion, Jr., AICP, Acting Director  
State of Hawaii Office of Planning  
Via E-Mail: Leo.R.Asuncion@hawaii.gov

Bryan C. Yee, Deputy Attorney General  
Department of the Attorney General  
Via E-Mail: Bryan.C.Yee@hawaii.gov

## **RE: SMB II LLC - SOLAR ENERGY WITHIN AN AGRICULTURAL ENERGY FACILITY**

Dear Sirs:

We represent SMB II LLC. We are sending this letter in follow up to the meeting that Mr. Unowitz and I had with Chair Enright and members of his staff and Deputy Attorney General Yee on January 29, 2016. Acting Director for the State Office of Planning was not at that meeting. However, Mr. Yee indicated that the Office of Planning may share similar concerns as those expressed by the Department of Agriculture. Mr. Yee also indicated that one or both of these agencies are considering challenging the Conditional Use Permit (minor) that was issued by the City Department of Planning and Permitting for the SMB II project.

We are sending this letter to both agencies in a sincere attempt to resolve the current misunderstanding.<sup>1</sup> Should you wish, we are receptive to further discussions with the Department of Agriculture and to discussions with the Office of Planning on this matter.

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<sup>1</sup> Should the DOA or the State Office of Planning decide to pursue what we believe, based upon the facts and law presented to date, would be a frivolous appeal, which results in any business interruption or loss or deprivation of civil rights, please be aware that SMB II reserves all rights and remedies available to it under state and federal law.

## I. INTRODUCTION

The purpose of the State Board of Agriculture, established under Act 44 on May 13, 1903 as the Board of Commissioners of Agriculture and Forestry is "to provide for the encouragement and protection of agriculture, horticulture and forestry." Similarly, the State Department of Agriculture ("**DOA**") is "dedicated to the preservation and productive use of agricultural resources so as to assure a healthy and adequate food supply for Hawaii's people, providing employment, maintaining a favorable balance of trade, and preserving the aesthetic quality of the Islands." Respectfully, we believe that the DOA should embrace a project that promotes productive use of agricultural land, and we fail to understand why the DOA would seek to destroy this opportunity to put currently unproductive agricultural land into productive use.

We understand that the DOA is concerned that agricultural energy facilities, as allowed under Hawaii Revised Statutes § 205-4.5(a)(17), only permits agricultural energy facilities that generate energy from agricultural products. However the DOA has not been able to provide any evidence to support this position. We believe that the position is unfounded based on the plain language of the statute and the legislative history behind the statute.

Setting aside the statutory language, which we believe clearly allows for solar, wind and other renewable energy projects as long as those projects meet the very high standard of qualifying as agricultural energy facilities, any concern that allowing the SMB II agricultural energy facility project (an agrivoltaic project) to go forward will somehow jeopardize the ban on solar energy projects within Land Study Bureau ("**LSB**") class A lands is unwarranted in this case. The SMB II project is unique and not likely to be replicated for reasons discussed in Section III below.

The agricultural energy facility planned by SMB II LLC encourages and protects agriculture. The AEF will require land that has been left fallow for years to be put into active agricultural production. The SMB II project clearly meets the objectives of Act 145 (the law that created the agricultural energy facility) articulated by the Legislature:

. . . Hawaii has among the most abundant renewable energy resources in the world, **in the form of solar**, geothermal, wind, biomass, and ocean energy assets.

The legislature further finds that **increased** energy efficiency and **use of renewable energy resources** would increase Hawaii's energy self-sufficiency, achieving broad societal benefits, including increased energy security, resistance to increases in oil prices, environmental sustainability, economic development, and job creation.

**To shape Hawaii's energy and agricultural future and achieve the goal of energy and food self-sufficiency for the state, our efforts must continue on all fronts, integrating new and evolving technologies, seizing upon opportunities to become more economically diversified, and providing incentives and assistance to address barriers.** It is crucial to address the negative impacts that rising and volatile petroleum prices have on fuel and fertilizer.

Act 145 (2008), §1. A copy of Act 145 is enclosed.

The Legislature noted the abundance of solar as a source for renewable energy, and called for increased use of renewable energy resources, and new technologies to achieve the dual goals of energy and food self-sufficiency. The SMB II agricultural energy facility achieves these purposes.

## II. **SUMMARY OF HAWAII REVISED STATUTES SECTION 205-4.5(a)(17)**

Hawaii Revised Statutes § 205-2(d) lists the uses that are allowed within the State Agricultural District, and HRS § 205-4.5(a) provides a limited subset of permitted uses within the Agricultural District on LSB A and B soils. Agricultural energy facilities ("AEF") are permitted on all LSB soil types in the State Agricultural District under HRS § 205-4.5(a)(17).<sup>2</sup>

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<sup>2</sup> We note that photovoltaic uses are clearly allowed in LSB A and B lands without any land area limitation as long as the energy produced is solely for the agricultural activities of the fee or leasehold owner of the property. See HRS § 205-4.5(a)(10) (listing "photovoltaic, biogas, and other small-scale renewable energy systems").

The language allowing for and defining AEF is as follows:

Agricultural-energy facilities, including **appurtenances** ["Appurtenances" means "operational infrastructure of the appropriate type and scale for the economic commercial generation, storage, distribution, and other similar handling of energy, including equipment, feedstock, fuels, and other products of agricultural-energy facilities"] necessary for an **agricultural-energy enterprise** ["Agricultural-energy enterprise" means "an enterprise that integrally incorporates an agricultural activity with an agricultural-energy facility"] provided that the primary activity of the agricultural-energy enterprise is **agricultural activity** ["Agricultural activity" means "(1) Cultivation of crops, including crops for bioenergy, flowers, vegetables, foliage, fruits, forage, and timber; (2) Game and fish propagation; (3) Raising of livestock, including poultry, bees, fish, or other animal or aquatic life that are propagated for economic or personal use].

To be considered the **primary activity** of an agricultural-energy enterprise, the total acreage devoted to agricultural activity shall be **not less than ninety per cent of the total acreage of the agricultural-energy enterprise**. The agricultural-energy facility shall be limited to lands owned, leased, licensed, or operated by the entity conducting the agricultural activity.

"Agricultural-energy facility" means a facility that generates, stores, or distributes **renewable energy** as defined in section 269-91 ["Renewable energy" as defined under HRS § 269-91 means energy generated or produced using the following sources: (1) Wind; (2) The sun; (3) Falling water; (4) Biogas, including landfill and sewage-based digester gas; (5) Geothermal; (6) Ocean water, currents, and waves, including ocean thermal energy conversion; (7) Biomass, including biomass crops, agricultural and animal residues and wastes, and municipal solid waste and other solid waste; (8) Biofuels; and (9) Hydrogen produced from renewable energy sources] **or** renewable fuel including electrical or thermal energy or liquid or gaseous fuels from products of agricultural activities from agricultural lands located in the State.

HRS § 205-4.5(a)(17) (emphasis and definitions added).

The plain language of HRS §205-4.5(a)(17) allows solar energy facilities within Agricultural District, LSB A lands as long, and only if, the solar energy facility qualifies as an AEF.

A. **Legislative History of Act 145 (SB 2849 SD1, HD 1, CD 1) (2008).**

The right to operate an AEF within LSB A and B soils was created in 2008 by Act 145 (Senate Bill 2849, SD1, HD1, CD1). The purpose of Act 145 was twofold. One purpose dealt with plantation community subdivisions, which is beyond the scope of this letter. The other purpose was to "Permit the use of lands in agricultural land use districts for agricultural-energy facilities when the production, storage, and distribution of renewable energy are integrated with an agricultural activity." Various state agencies, community groups, and private entities submitted testimony in support of the Bill.

The DOA submitted testimony dated March 18, 2008 in support of SB 2849, SD1, but urged the Legislature to make it even broader to capture more renewable energy alternatives. In testimony the DOA stated:

The bill requires agricultural production to be the primary use of qualified agricultural land. However, because the bill requires a tight organizational linkage between the agricultural-energy facility, the operator of the facility, and the minimum area to be put into feedstock production, **this may have the effect of inadvertently excluding similar but not the same agriculture-based renewable energy concepts from consideration as permissible uses.** We believe this bill **should cast a wider net to encompass these similar uses in order to allow and encourage more agriculture-based renewable energy alternatives.** Furthermore, this bill and other similar vehicles must recognize and establish a balance between the desire to increase Hawaii's agriculture based renewable energy resources and other agricultural production needs such as food production.

Testimony of Sandra Lee Kunimoto, March 18, 2008 re SB 2849, SD1, copy attached.<sup>3</sup>

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<sup>3</sup> The Office of State Planning submitted testimony on SB2849, however that testimony was limited to statements regarding plantation community subdivisions. See attached.

The DOA's concern was addressed in the Committee on Energy & Environmental Protection Standing Committee Report No. 1309, dated March 20, 2008. The Committee noted that the DOA "supported the intent of this measure" and the Committee amended the Bill by **"Clarifying the types of renewable energy generated, stored, or distributed by an agricultural-energy facility."** See attached. The amendment is significant in that it clarified that "renewable energy" included all uses defined under HRS § 269-91.

There were four versions of SB 2849: (1) the original; (2) SD1, adopted Feb. 29; (3) HD1, adopted March 19; and (4) CD1, adopted April 24. DOA's testimony was on SD1, and the Bill was amended shortly thereafter, as described in the Standing Committee Report dated March 20. The amendment is significant because it clarified that the term "renewable energy" was intended to be broad, as recommended by the DOA, and specified that in the context of an AEF "renewable energy" was defined under HRS §269-91. The differences are noted in the table below.

SB No. 2849 and SB 2849 SD1 (2/29/08)	SB 2849 SD1,HD1 (3/18/08) & CD1 (i.e, Act 145)
"Agricultural-energy facility" means a facility that generates, stores, or distributes renewable energy or renewable fuel including electrical or thermal energy or liquid or gaseous fuels from products of agricultural activities from agricultural lands located in the state.	"Agricultural-energy facility" means a facility that generates, stores, or distributes renewable energy <b>as defined in section 269-91</b> or renewable fuel including electrical or thermal energy or liquid or gaseous fuels from products of agricultural activities from agricultural lands located in the state.

The significant change that was made between SD1 and HD1 was a revision to expand the definition of "renewable energy" to be "as defined in section 269-91." Under HRS § 269-91 renewable energy includes energy generated or produced using the sun. This change removed any doubt that the AEF had to produce energy from only biofuels, or that solar energy could never qualify as an AEF.

The House floor discussion on April 29, 2008 confirms that SB 2849 in its final version, i.e., SD1, HD1, CD1, was intended to allow solar projects as well as other renewable energy

uses. Representative Thielen spoke in opposition to SB 2849 because she did not support enhancing a biofuel industry in Hawaii. However, Representative Morita spoke in strong support of SB 2849, as did Representative Caldwell.

Representative Morita, Chair of the Committee on Energy & Environmental Protection, the same Committee that added the reference to HRS § 269-91, explained:

**What this measure attempts to clarify is that a renewable project, such as a solar project, that is integrated within an agricultural enterprise shall be an allowed use.** The purpose section of this measure states that increased energy efficiency and use of renewable energy resources would increase Hawaii's energy self-sufficiency, achieving broad societal benefits, including increased energy security, resistance to increases in oil prices, environmental sustainability, economic development, and job creation.

See 2008 House Journal, p. 885, copy enclosed.

Rep. Caldwell also spoke in favor of SB 2849 was trying to make productive use of agricultural lands instead of letting developers try to "grow houses" on such lands. "This is about trying to **save our agricultural lands and do something productive with it.**" *Id.* After this floor discussion members of the House took a vote on SB 2849, SD1, HD1, CD1, which passed with 49 ayes to 1 no.

1. **Renewable Energy Under HRS § 269-91**

Under HRS § 269-91, renewable energy means:

energy generated or produced using the following sources:

- (1) Wind;
- (2) The sun;
- (3) Falling water;
- (4) Biogas, including landfill and sewage-based digester gas;
- (5) Geothermal;
- (6) Ocean water, currents, and waves, including ocean thermal energy conversion;
- (7) Biomass, including biomass crops, agricultural and animal

- residues and wastes, and municipal solid waste and other solid waste;
- (8) Biofuels; and
- (9) Hydrogen produced from renewable energy sources.

Only four out of the nine sources mentioned in HRS § 269-91 could ever be derived from products of agricultural activities: biogas, biomass, biofuels, and hydrogen (only if produced from biomass sources). Five of the nine sources--wind, the sun, falling water, geothermal, and ocean-derived energy sources--can never be derived from products of agricultural activities. Therefore an interpretation of the law that an AEF must generate, store, or distribute renewable energy only from products of agricultural activities, and not from solar power, renders the incorporation of HRS § 269-91 both void and insignificant, which is contrary to fundamental rules of statutory construction. *See also Pavsek v. Sandvold*, 127 Hawai'i 390, 398 (2012) (declining to adopt a statutory interpretation "which relies on conjecture and hidden meaning that are not supported by the statute's legislative history.").

**2. Biofuel Production Was Already a Permitted Use In LSB A Lands When Act 145 Was Passed in 2008**

If the Legislature intended to limit AEF to only those facilities that generate energy from crops, and not allow all forms of renewable energy as defined under HRS § 269-91, it surely knew what words to use because it had addressed just such uses the year before. Under Act 159, passed in 2007, the Legislature made "Biofuel processing facilities" an expressly permitted use within the Agricultural District on LSB A and B soils.

Permissible uses within the agricultural districts. (a) Within the agricultural district, all lands with soil classified by the land study bureau's detailed land classification as overall (master) productivity rating class A or B shall be restricted to the following permitted uses:

\* \* \*

Biofuel processing facilities, including the appurtenances associated with the production and refining of biofuels that is normally considered directly accessory and secondary to the growing of the energy feedstock; provided that biofuels processing

facilities and appurtenances do not adversely impact agricultural land and other agricultural uses in the vicinity.

For the purposes of this paragraph:

"Appurtenances" means operational infrastructure of the appropriate type and scale for economic commercial storage and distribution, and other similar handling of feedstock, fuels, and other products of biofuels processing facilities.

"Biofuel processing facility" means a facility that produces liquid or gaseous fuels from organic sources such as biomass crops, agricultural residues, and oil crops, including palm, canola, soybean, and waste cooking oils; grease; food wastes; and animal residues and wastes that can be used to generate energy.

See Act 159 (2007), currently codified as HRS § 205-4.5(a)(16).

If the AEF allowed under Act 145 was intended to be limited to energy produced from products of agricultural lands, as suggested by DOA, the Legislature had readymade language to express that limitation. But the Legislature did not limit AEFs that way because Act 145 was not intended to prohibit renewable energy from the sun, the wind, falling water or ocean water. The plain language of Act 145 does not support the DOA's interpretation that solar facilities can never be used within an AEF.

**III. THE SMB II PROJECT WILL NOT OPEN THE FLOODGATES TO ALLOW SOLAR ENERGY FACILITIES ON LSB A SOILS. THE LEGAL STANDARD FOR AN AEF IS VERY HIGH AND MANDATES AGRICULTURAL PRODUCTION, WHICH PROMOTES THE APPROPRIATE USE OF AGRICULTURAL LANDS**

An important aspect of the SMB II project is that it requires SMB II to make productive agricultural use of land that has not been cultivated in years. The SMB II project does not eject an existing agricultural use in order to establish a new agricultural use for the purposes of establishing an AEF. The SMB II project creates a win-win by **requiring** agricultural production on currently inactive land in the pursuant of renewable energy. It should be kept in mind that under Hawaii law, 100% of electricity sales in the state must be from renewable energy source by 2045.

A project would not qualify as an AEF if it eliminated bona fide agricultural activities only to replace those activities with ones that facilitate the renewable energy project. The standard for qualifying as an AEF is very high under HRS §205-4.5(a)(17). The agricultural and renewable energy activities must be integrally incorporated, and the primary purpose of the AEF must be agricultural activities. Fake farms should never be able to pass that test.

**A. There Are Several Checks And Balances To Ensure That The SMB II Project Remains A Genuine AEF**

The permit issued by the Department of Planning and Permitting requires the SMB II project to operate as an AEF. If there is ever a failure to conduct agricultural activities, the project would be subject to a notice of violation from the City. Furthermore, SMB II submitted an Agricultural Plan to the DOA for review and approval on January 29, 2016 (Agricultural Plan for TMK No. (1) 8-5-019:014(por.) At 85-485C Waianae Valley Road, Waianae, Oahu, by Victor Bhatti, President, Betel Garden LLC), copy enclosed.

The DOA has the ability to require reasonable reporting and monitoring of the agricultural activities through its approval of the Agricultural Plan. In that way the DOA can be assured that the SMB II project remains a genuine AEF, and the DOA will know that appropriate use of LSB A soils is taking place. A violation of the Agricultural Plan could constitute a violation of the City's permit, potentially subjecting SMB II to a notice of violation and a cease and desist order and other penalties.

Section 21-2.150-2 of the Honolulu Land Use Ordinance provides in relevant part as follows:

Administrative enforcement. [I]f the director determines that any person is violating any provision of this chapter, any rule adopted thereunder or any permit issued pursuant thereto, the director may have the person served, by mail or delivery, with a notice of violation and order pursuant to this section.

\* \* \*

(b) Contents of Order.

(1) The order may require the person to do any or all of the following:

(A) Cease and desist from the violation;

(B) Correct the violation at the person's own expense before a date specified in the order;

(C) Pay a civil fine not to exceed \$1,000.00 in the manner, at the place and before the date specified in the order;

(D) Pay a civil fine not to exceed \$1,000.00 per day for each day in which the violation persists, in the manner and at the time and place specified in the order.

These enforcement rights are in addition to the Department of Planning and Permitting's criminal prosecution rights under LUO Section 21-2.150.1

Should the SMB II project become subject to a cease and desist order, the federal government will have the ability to demand repayment of the federal reimbursement funds discussed in Section B below. SMB II is required to submit to the federal government on an annual basis supporting documentation that provides evidence of annual energy production. Failure to continue the energy production due to a cease and desist order from the City would subject SMB II to substantial penalties from the federal government.

**B. FIT Program And Financial Feasibility**

The renewable energy aspect of the SMB II project is under the Hawaiian Electric Company's Feed-In-Tariff ("FIT") program. The FIT program is of limited duration and was designed to encourage more renewable energy project. As explained by HECO, pre-established FIT rates and standardized FIT contract terms were approved to provide an easy way for individuals, small businesses, governmental entities, or other developers to sell renewable energy to Hawaiian Electric. The FIT program is closed to new applicants.

As of this time last year, 98 projects, comprising 49.417 MW of capacity, were in the active queues across the three Hawaiian Electric Companies, and the reserve queue was

eliminated under PUC Decision and Order No. 32499. In other words, the FIT door has shut.

The status of the FIT program is relevant because it is only due to the economics of the FIT program that the SMB II project can be developed as an AEF. That is why it is extremely unlikely that similar AEF projects will be pursued. Under the FIT program SMB II is responsible for the all costs associated with the development of the project, including design, permitting, materials and construction costs, financing, land leasing, insurance and operations and maintenance costs. SMB II is required to submit to HECO (as well as the federal and State governments) an itemization of all of these costs within 30 days of when the AEF begins producing energy. The term of the FIT agreement with the utility is twenty years from the date that the renewable energy system is placed into service.

SMB II estimates that the design, permitting, materials and construction costs for the project will be \$2,700,000.00. These costs are significantly higher than a typical solar farm. The SMB II project has panels that are raised 7' to 11' above the ground so that agricultural activities can take place beneath the panels. In contrast, panels in a typical solar farm are only 3' to 5' above ground. The additional height at the SMB II project requires additional steel framework, which is necessary so that agricultural activities can take place underneath the panels.

In the SMB II project the rows of panels are 12' apart so that angled sunlight can reach the crops underneath. Whereas in a typical solar farm the rows of panels are less than 6' apart, meaning that more panels can be placed within a small land area if there is no need to allow sunlight to reach the areas underneath the panels. In addition, a typical solar farm, with a spacing of 6' between rows of panels, would not require the 2 acre of land that the SMB II project requires, and therefore would be less expensive than the AEF planned by SMB II.

Another construction consideration comes from the requirement that in an AEF "the total acreage devoted to agricultural activity shall be not less than ninety per cent of the total acreage of the agricultural-energy enterprise." HRS § 205-4.5(a)(17). The SMB II project has been designed to that the total land coverage used for renewable energy production is well under 1,000

sq ft within the entire 2-acre site. That means that 99% of the site will be devoted to agricultural activities. These necessary accommodations for the agricultural activities increase the design and construction costs by at least 30% to 35% in comparison to a typical solar farm project.

SMB II will pay the landowner \$25,000.00/year for 20 years to lease the 2-acre site (\$500,000.00). As described in the Agricultural Plan, the farmer will not pay any rent for the use of the AEF site. The lease rent will be paid entirely by SMB II. In addition, SMB II estimates that insurance and operations and maintenance costs will run approximately \$15,000.00 a year. In total, SMB II will pay approximately \$40,000.00/year in rent, insurance, operations and maintenance (for a total of approximately \$800,000.00).

Under the standard FIT Agreement (not a negotiated power purchase agreement, but a form agreement prepared by the utility company), Hawaiian Electric pays \$0.23.8 cents/kWh. However the FIT program was closed to new applicants a few years ago. The current rate that Hawaiian Electric negotiates under power purchase agreements for larger, non-FIT, projects is in the range of \$0.12/kWh, and the utility is only pursuing largescale renewable energy projects. The FIT program is a key reason why SMB II can afford the high construction and land costs for this AEF.

The final component of this project that makes it unique, financially feasible and unlikely to be replicated, is that SMB II can pursue repayment for a portion of the construction costs under the American Recovery and Reinvestment Act of 2009. Under the section 1603 program, developers can get reimbursed from the federal government for a portion of the costs of installing qualified renewable energy projects. The section 1603 program terminates at the end of 2016, which is the deadline for putting these projects into operation. Unlike the federal solar tax credit program, which was recently extended by Congress, the reimbursement program was not extended. Any project that is not in operations by the end of 2016 will not be able to claim this reimbursement.

SMB II estimates that it may be able to receive reimbursement from the federal government of a maximum amount of 28% of the design/permitting/construction costs, i.e., a maximum of \$750,870.00 if the project is placed into service before the end of 2016, and a maximum of \$350,000.00 from the State of Hawaii.

What these numbers mean is that few others will ever be in the position to pursue the expensive design, construction and land costs required to incorporate bona fide agricultural activities into a solar farm or other renewable energy project. Therefore few others, if any, will be able to establish a true AEF using renewable energy generated by the sun.

The financials break out as follows:

2,700,000 design/construction/permitting  
- 750,870 federal reimbursement  
- 350,000 state reimbursement  
\$1,599,130.00 net costs to SMB II, not including \$40k/yr in rent, insurance and o&m costs.

HECO price/year under FIT Agreement  $\$0.23.8 \times 1,000,000 = \$238,000.00$ , less  $\$40,000/\text{yr}$  for the land and related expenses = net payment to SMB II of  $\$198,000.00$

Typical HECO price/year under non-FIT projects  $\$0.12 \times 1,000,000 = \$120,000.00$ , less  $\$40,000/\text{yr}$  for the land and related expenses = net payment of  $\$80,000.00$

These economics mean that a similar non-FIT project would need to operate for 20 years just to break even, even if that project could qualify for the federal and state reimbursements discussed above ( $1,599,130$  net capital costs /  $80,000$  net payment from HECO = 19.99 years). It seems implausible that anyone would invest  $\$2.7\text{M}$  today into a project that would return a net profit of  $\$0$  twenty years from now.

If the non-FIT project did not qualify for the federal and state reimbursements, the project developer's break-even point would be 33.75 years! It is inconceivable that anyone would pursue this very specific and much more expensive type of solar AEF under these circumstances. The economic realities mean that the SMB II project will not open a floodgate of solar AEF.

#### IV. CONCLUSION

In this case we are faced with a clear statute that allows for any type of renewable energy to qualify as an AEF as long as the type of renewable energy is listed under HRS § 269-91 and the 90% acreage and linkage between the agricultural activities and the renewable energy project is established. However, assuming *arguendo* that there is an ambiguity in the definition of AEF Hawaii courts will look to the reason and spirit of Chapter 205. The SMB II AEF project promotes the objectives of Chapter 205.

As quoted by the Hawaii Supreme Court in *Curtis v. Board of Appeals, County of Hawai'i*, 90 Hawai'i 384, 978 P.2d 822 (1999) regarding Chapter 205, HRS:

The stated purpose of the law is, *inter alia*: to protect and conserve through zoning the urban, agricultural and conservation lands within all the counties. A coordinated, balanced approach not only within each county but an overall balance of statewide land needs for economic growth is essential to:

- (1) Utilize the land resources in an intelligent, effective manner based upon the capabilities and characteristics of the soil and the needs of the economy;
- (2) Conserve forests, water resources and land, particularly to preserve the prime agricultural lands from unnecessary urbanization;
- (3) State the allocation of land for development in an orderly plan to meet actual needs and minimize costs of providing utilities and other public services.

Hse. Stand. Comm. Rep. No. 395, in 1961 House Journal, at 855-56; *cited in Curtis v. Bd. of Appeals, Cty. of Hawai'i*, 90 Hawai'i 384, 396, 978 P.2d 822, 834 (1999), as amended (June 15, 1999).

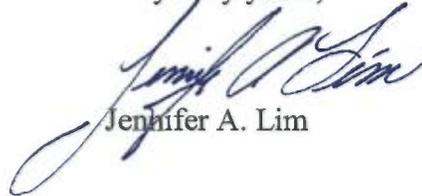
The overarching purpose of Chapter 205 is to "protect and conserve" natural resources and foster "intelligent," "effective," and "orderly" land allocation and development. *See* 1961 Haw. Sess. L. Act 187, § 1 at 299. Objecting to a project that would require productive

Scott E. Enright, Chairperson  
Leo R. Asuncion, Jr., AICP, Acting Director  
Bryan C. Yee, Deputy Attorney General  
February 3, 2016  
Page 16

agricultural use of fallow land does nothing to protect and conserve natural resources. Instead, it encourages waste, and fails to promote the agricultural goals of Chapter 205. A blind adherence to an erroneous belief that solar facilities can never be placed on LSB A soils ignores the plain language and intent of Act 145. The SMB II AEF will utilize 2 acres of land that have not been farmed in years, and do so in an intelligent and effective manner for twenty years.

Thank you for your consideration of this matter.

Very truly yours,



Jennifer A. Lim

Enclosure(s)

Act 145 (2008)  
Testimony of Sandra Lee Kunimoto, March 18, 2008 re SB 2849, SD1  
Testimony of the Office of State Planning, March 18 and 24, 2008  
Committee on Energy & Environmental Protection Standing Committee Report No.  
1309, dated March 20, 2008  
2008 House Journal (59th day), p. 885  
Agricultural Plan for TMK No. (1) 8-5-019:014(por.) At 85-485C Waianae Valley Road,  
Waianae, Oahu

cc: Sam Fujikawa  
Marc Unowitz

4847-1033-6557.1.067811-00001





GOV. MSG. NO. 787

EXECUTIVE CHAMBERS  
HONOLULU

LINDA LINGLE  
GOVERNOR

June 5, 2008

The Honorable Colleen Hanabusa, President  
and Members of the Senate  
Twenty-Fourth State Legislature  
State Capitol, Room 409  
Honolulu, Hawaii 96813

Dear Madam President and Members of the Senate:

This is to inform you that on June 5, 2008, the following bill was signed into law:

SB2849 SD1 HD1 CD1

A BILL FOR AN ACT RELATING TO  
AGRICULTURAL LANDS.  
(ACT 145)

Sincerely,

A handwritten signature in black ink, appearing to read "Linda Lingle".

LINDA LINGLE

Approved by the Gov. or  
on JUN 5 2008

THE SENATE  
TWENTY-FOURTH LEGISLATURE, 2008  
STATE OF HAWAII

**ACT 145**  
**S.B. NO.** 2849  
S.D. 1  
H.D. 1  
C.D. 1

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## A BILL FOR AN ACT

RELATING TO AGRICULTURAL LANDS.

**BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF HAWAII:**

1           SECTION 1. The legislature finds that Hawaii's dependence  
2 on petroleum for over ninety per cent of its energy needs is  
3 more than any other state in the nation. This makes the State  
4 extremely vulnerable to any oil embargo, supply disruption,  
5 international market dysfunction, and many other factors beyond  
6 the control of the State. Furthermore, the continued  
7 consumption of conventional petroleum fuel and price volatility  
8 can negatively impact the viability of agricultural operations.  
9 At the same time, Hawaii has among the most abundant renewable  
10 energy resources in the world, in the form of solar, geothermal,  
11 wind, biomass, and ocean energy assets.

12           The legislature further finds that increased energy  
13 efficiency and use of renewable energy resources would increase  
14 Hawaii's energy self-sufficiency, achieving broad societal  
15 benefits, including increased energy security, resistance to  
16 increases in oil prices, environmental sustainability, economic  
17 development, and job creation.



1 To shape Hawaii's energy and agricultural future and  
2 achieve the goal of energy and food self-sufficiency for the  
3 state, our efforts must continue on all fronts, integrating new  
4 and evolving technologies, seizing upon opportunities to become  
5 more economically diversified, and providing incentives and  
6 assistance to address barriers. It is crucial to address the  
7 negative impacts that rising and volatile petroleum prices have  
8 on fuel and fertilizer.

9 The purpose of this Act is to:

- 10 (1) Permit the use of lands in agricultural land use  
11 districts for agricultural-energy facilities when the  
12 production, storage, and distribution of renewable  
13 energy are integrated with an agricultural activity;  
14 and  
15 (2) Allow existing structures on plantation community  
16 subdivisions to be used or rehabilitated for employee  
17 rental housing at affordable rates for agricultural  
18 workers and agricultural support buildings for  
19 agricultural business operators and support services.

20 SECTION 2. Section 205-2, Hawaii Revised Statutes, is  
21 amended by amending subsection (d) to read as follows:

22 "(d) Agricultural districts shall include:



- 1 (1) Activities or uses as characterized by the cultivation  
2 of crops, crops for bioenergy, orchards, forage, and  
3 forestry;
- 4 (2) Farming activities or uses related to animal  
5 husbandry, and game and fish propagation;
- 6 (3) Aquaculture, which means the production of aquatic  
7 plant and animal life within ponds and other bodies of  
8 water;
- 9 (4) Wind generated energy production for public, private,  
10 and commercial use;
- 11 (5) Biofuel production as described in section  
12 205-4.5(a)(15) for public, private, and commercial  
13 use;
- 14 (6) Bona fide agricultural services and uses that support  
15 the agricultural activities of the fee or leasehold  
16 owner of the property and accessory to any of the  
17 above activities, whether or not conducted on the same  
18 premises as the agricultural activities to which they  
19 are accessory, including [~~but not limited to~~] farm  
20 dwellings as defined in section 205-4.5(a)(4),  
21 employee housing, farm buildings, mills, storage  
22 facilities, processing facilities, agricultural-energy



1           facilities as defined in section 205-4.5(a)(16),  
2           vehicle and equipment storage areas, roadside stands  
3           for the sale of products grown on the premises, and  
4           plantation community subdivisions as defined in  
5           section 205-4.5(a)(12);

6           (7) Wind machines and wind farms;

7           (8) Small-scale meteorological, air quality, noise, and  
8           other scientific and environmental data collection and  
9           monitoring facilities occupying less than one-half  
10          acre of land; provided that these facilities shall not  
11          be used as or equipped for use as living quarters or  
12          dwellings;

13          (9) Agricultural parks;

14          (10) Agricultural tourism conducted on a working farm, or a  
15          farming operation as defined in section 165-2, for the  
16          enjoyment, education, or involvement of visitors;  
17          provided that the agricultural tourism activity is  
18          accessory and secondary to the principal agricultural  
19          use and does not interfere with surrounding farm  
20          operations; and provided further that this paragraph  
21          shall apply only to a county that has adopted



1           ordinances regulating agricultural tourism under  
2           section 205-5; and

3           (11) Open area recreational facilities.

4   Agricultural districts shall not include golf courses and golf  
5   driving ranges, except as provided in section 205-4.5(d).

6   Agricultural districts include areas that are not used for, or  
7   that are not suited to, agricultural and ancillary activities by  
8   reason of topography, soils, and other related characteristics."

9           SECTION 3. Section 205-4.5, Hawaii Revised Statutes, is  
10   amended by amending subsection (a) to read as follows:

11           "(a) Within the agricultural district, all lands with soil  
12   classified by the land study bureau's detailed land  
13   classification as overall (master) productivity rating class A  
14   or B shall be restricted to the following permitted uses:

- 15           (1) Cultivation of crops, including [~~but not limited to~~]  
16                 crops for bioenergy, flowers, vegetables, foliage,  
17                 fruits, forage, and timber;
- 18           (2) Game and fish propagation;
- 19           (3) Raising of livestock, including [~~but not limited to~~]  
20                 poultry, bees, fish, or other animal or aquatic life  
21                 that are propagated for economic or personal use;



- 1 (4) Farm dwellings, employee housing, farm buildings, or  
2 activities or uses related to farming and animal  
3 husbandry. "Farm dwelling", as used in this  
4 paragraph, means a single-family dwelling located on  
5 and used in connection with a farm, including clusters  
6 of single-family farm dwellings permitted within  
7 agricultural parks developed by the State, or where  
8 agricultural activity provides income to the family  
9 occupying the dwelling;
- 10 (5) Public institutions and buildings that are necessary  
11 for agricultural practices;
- 12 (6) Public and private open area types of recreational  
13 uses, including day camps, picnic grounds, parks, and  
14 riding stables, but not including dragstrips,  
15 airports, drive-in theaters, golf courses, golf  
16 driving ranges, country clubs, and overnight camps;
- 17 (7) Public, private, and quasi-public utility lines and  
18 roadways, transformer stations, communications  
19 equipment buildings, solid waste transfer stations,  
20 major water storage tanks, and appurtenant small  
21 buildings such as booster pumping stations, but not  
22 including offices or yards for equipment, material,



- 1            vehicle storage, repair or maintenance, treatment
- 2            plants, corporation yards, or other similar
- 3            structures;
- 4            (8) Retention, restoration, rehabilitation, or improvement
- 5            of buildings or sites of historic or scenic interest;
- 6            (9) Roadside stands for the sale of agricultural products
- 7            grown on the premises;
- 8            (10) Buildings and uses, including [~~but not limited to~~]
- 9            mills, storage, and processing facilities, maintenance
- 10           facilities, and vehicle and equipment storage areas
- 11           that are normally considered directly accessory to the
- 12           [~~above-mentioned~~] above-mentioned uses and are
- 13           permitted under section 205-2(d);
- 14           (11) Agricultural parks;
- 15           (12) Plantation community subdivisions, which as used in
- 16           this [~~paragraph~~] chapter means [a] an established
- 17           subdivision or cluster of employee housing, community
- 18           buildings, and [~~aereage-established~~] agricultural
- 19           support buildings on land currently or formerly owned,
- 20           leased, or operated by a sugar or pineapple plantation
- 21           [~~and in residential use~~]; provided that the existing
- 22           structures may be used or rehabilitated for use, and



1 new employee housing and agricultural support  
2 buildings may be allowed on land within the  
3 subdivision as follows:

4 (A) The employee housing is occupied by employees or  
5 former employees of the plantation[~~+, provided~~  
6 ~~that the employees or former employees shall~~] who  
7 have a property interest in the land;

8 (B) The employee housing units not owned by their  
9 occupants shall be rented or leased at affordable  
10 rates for agricultural workers; or

11 (C) The agricultural support buildings shall be  
12 rented or leased to agricultural business  
13 operators or agricultural support services;

14 (13) Agricultural tourism conducted on a working farm, or a  
15 farming operation as defined in section 165-2, for the  
16 enjoyment, education, or involvement of visitors;  
17 provided that the agricultural tourism activity is  
18 accessory and secondary to the principal agricultural  
19 use and does not interfere with surrounding farm  
20 operations; and provided further that this paragraph  
21 shall apply only to a county that has adopted

- 1           ordinances regulating agricultural tourism under  
2           section 205-5;
- 3       (14) Wind energy facilities, including the appurtenances  
4           associated with the production and transmission of  
5           wind generated energy; provided that the wind energy  
6           facilities and appurtenances are compatible with  
7           agriculture uses and cause minimal adverse impact on  
8           agricultural land;
- 9       (15) Biofuel processing facilities, including the  
10           appurtenances associated with the production and  
11           refining of biofuels that is normally considered  
12           directly accessory and secondary to the growing of the  
13           energy feedstock; provided that biofuels processing  
14           facilities and appurtenances do not adversely impact  
15           agricultural land and other agricultural uses in the  
16           vicinity.

17                   For the purposes of this paragraph:

18                   "Appurtenances" means operational infrastructure  
19                   of the appropriate type and scale for economic  
20                   commercial storage and distribution, and other similar  
21                   handling of feedstock, fuels, and other products of  
22                   biofuels processing facilities.



1 "Biofuel processing facility" means a facility  
2 that produces liquid or gaseous fuels from organic  
3 sources such as biomass crops, agricultural residues,  
4 and oil crops, including palm, canola, soybean, and  
5 waste cooking oils; grease; food wastes; and animal  
6 residues and wastes that can be used to generate  
7 energy[~~(+ or -)~~];

8 (16) Agricultural-energy facilities, including  
9 appurtenances necessary for an agricultural-energy  
10 enterprise; provided that the primary activity of the  
11 agricultural-energy enterprise is agricultural  
12 activity. To be considered the primary activity of an  
13 agricultural-energy enterprise, the total acreage  
14 devoted to agricultural activity shall be not less  
15 than ninety per cent of the total acreage of the  
16 agricultural-energy enterprise. The agricultural-  
17 energy facility shall be limited to lands owned,  
18 leased, licensed, or operated by the entity conducting  
19 the agricultural activity.

20 As used in this paragraph:

21 "Agricultural activity" means any activity  
22 described in paragraphs (1) to (3) of this subsection.



1           "Agricultural-energy enterprise" means an  
2           enterprise that integrally incorporates an  
3           agricultural activity with an agricultural-energy  
4           facility.

5           "Agricultural-energy facility" means a facility  
6           that generates, stores, or distributes renewable  
7           energy as defined in section 269-91 or renewable fuel  
8           including electrical or thermal energy or liquid or  
9           gaseous fuels from products of agricultural activities  
10           from agricultural lands located in the State.

11           "Appurtenances" means operational infrastructure  
12           of the appropriate type and scale for the economic  
13           commercial generation, storage, distribution, and  
14           other similar handling of energy, including equipment,  
15           feedstock, fuels, and other products of agricultural-  
16           energy facilities;

17           or

18   [+(16)+] (17) Construction and operation of wireless  
19   communication antennas; provided that, for the purposes  
20   of this paragraph, "wireless communication antenna"  
21   means communications equipment that is either  
22   freestanding or placed upon or attached to an already



1 existing structure and that transmits and receives  
2 electromagnetic radio signals used in the provision of  
3 all types of wireless communications services; provided  
4 further that nothing in this paragraph shall be  
5 construed to permit the construction of any new  
6 structure that is not deemed a permitted use under this  
7 subsection."

8 SECTION 4. Statutory material to be repealed is bracketed  
9 and stricken. New statutory material is underscored.

10 SECTION 5. This Act shall take effect upon its approval.

APPROVED this 5 day of JUN, 2008



GOVERNOR OF THE STATE OF HAWAII





LINDA LINGLE  
Governor



State of Hawaii  
DEPARTMENT OF AGRICULTURE  
1428 South King Street  
Honolulu, Hawaii 96814-2512

SANDRA LEE KUNIMOTO  
Chairperson, Board of Agriculture

DUANE K. OKAMOTO  
Deputy to the Chairperson

TESTIMONY OF SANDRA LEE KUNIMOTO  
CHAIRPERSON, BOARD OF AGRICULTURE

BEFORE THE HOUSE COMMITTEE ON  
ENERGY AND ENVIRONMENTAL PROTECTION  
TUESDAY, MARCH 18, 2008  
9:00 a.m.  
Room 312

SENATE BILL 2849, SENATE DRAFT 1  
RELATING TO AGRICULTURAL LANDS

Chairperson Morita and Members of the Committee:

Thank you for the opportunity to testify on Senate Bill No. 2849, Senate Draft 1. The Department of Agriculture supports the intent of this bill and the efforts to provide for affordable agricultural worker housing in plantation community subdivisions and increase the development and use of agriculture-based renewable energy resources in as broad a manner as possible. This bill proposes to establish "agricultural-energy facilities" operated by "agricultural-energy enterprises" as a permissible use in the Agricultural District with the condition that "...the total acreage devoted to agricultural activity by an agricultural-energy enterprise shall not be less than ninety per cent of the total acreage owned, leased, licensed, or operated by the agricultural-energy enterprise." An agricultural-energy enterprise is defined as a business that "...integrally incorporates an agricultural activity with an agricultural-energy facility." An "agricultural-energy facility" is defined as a facility that generates, stores or distributes renewable energy or fuel derived from products of agricultural activities from agricultural lands located in Hawaii. The "agricultural activity" can be located anywhere in the State and is limited to;

- "(1) Cultivation of crops, including but not limited to crops for bioenergy, flowers, vegetables, foliage, fruits, forage, and timber;

- (2) Game and fish propagation;
- (3) Raising of livestock, including but not limited to poultry, bees, fish, or other animal or aquatic life that are propagated for economic or personal use;"

This bill also amends Section 205-4.5(a)(12) relating to plantation community subdivisions, by providing for the rehabilitation and use of employee housing for rental to agricultural workers at affordable rates and use of agricultural support buildings for rental to agricultural business operators or agricultural support services. This amendment expands the utility of employee housing in plantation community subdivisions such as Kunia Village to allow rental by current agricultural workers that are not former plantation employees but work on farms in the area. To assist the counties in their enforcement of the provisions of this section, there may be need to specify who qualifies as agricultural workers, agricultural business operators, and agricultural support services.

The bill requires agricultural production to be the primary use of qualified agricultural land. However, because the bill requires a tight organizational linkage between the agricultural-energy facility, the operator of the facility, and the minimum area to be put into feedstock production, this may have the effect of inadvertently excluding similar but not the same agriculture-based renewable energy concepts from consideration as permissible uses. We believe this bill should cast a wider net to encompass these similar uses in order to allow and encourage more agriculture-based renewable energy alternatives. Furthermore, this bill and other similar vehicles must recognize and establish a balance between the desire to increase Hawaii's agriculture-based renewable energy resources and other agricultural production needs such as food production.





**DEPARTMENT OF BUSINESS,  
ECONOMIC DEVELOPMENT & TOURISM**

LINDA LINGLE  
GOVERNOR  
THEODORE E. LIU  
DIRECTOR  
MARK K. ANDERSON  
DEPUTY DIRECTOR  
ABBEY SETH MAYER  
INTERIM DIRECTOR  
OFFICE OF PLANNING

**OFFICE OF PLANNING**

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813  
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846  
Fax: (808) 587-2824

Statement of  
**ABBEY SETH MAYER**  
Interim Director, Office of Planning  
Department of Business, Economic Development, and Tourism  
before the  
**HOUSE COMMITTEE ON ENERGY AND ENVIRONMENTAL PROTECTION**  
Tuesday, March 18, 2008  
9:00 AM  
State Capitol, Conference Room 312

in consideration of  
**SB 2849, SD1**  
**RELATING TO AGRICULTURAL LANDS.**

Chair Morita, Vice Chair Carroll, and Members of the House Committee on Energy and Environmental Protection.

The Office of Planning (OP) has the following comments on the sections in SB 2849, SD1, that pertain to plantation community subdivisions.

SD1 has added language to define and clarify that existing structures in plantation community subdivisions can be rehabilitated and used for agricultural worker rental housing and business support services.

OP recommends the following change in language in Section 3, under part (12) to read "...where the existing structures are used or rehabilitated for use as provided herein:" The recommendation removes language that might potentially allow for increasing the size or scope of existing structures. In addition, the SD1 should be further amended to include language in the Section 1 findings referencing these changes and making clear that they are intended to accommodate existing, historically-used plantation housing and structures.

Thank you for the opportunity to testify.



**DEPARTMENT OF BUSINESS,  
ECONOMIC DEVELOPMENT & TOURISM**

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Statement of  
**ABBEY SETH MAYER**  
Interim Director, Office of Planning  
Department of Business, Economic Development, and Tourism  
before the  
**HOUSE COMMITTEE ON WATER, LAND, OCEAN RESOURCES  
AND HAWAIIAN AFFAIRS**  
And  
**HOUSE COMMITTEE ON AGRICULTURE**  
Monday, March 24, 2008  
11:00 AM  
State Capitol, Conference Room 312  
  
in consideration of  
**SB 2849, SD1, HD1**  
**RELATING TO AGRICULTURAL LANDS.**

Chairs Ito and Tsuji, Vice Chairs Karamatsu and Brower, and Members of the House Committees on Water, Land, Ocean Resources & Hawaiian Affairs and Agriculture.

HD1 contains amendments pertaining to plantation community subdivisions (PCS) that were recommended by the Office of Planning, i.e. the deletion of language that allows existing structures on PCS to be increased in size and scope. Therefore, we have no objections to these sections.

Thank you for the opportunity to testify.



Honolulu, Hawaii

March 20, 2008

RE: S.B. No. 2849  
S.D. 1  
H.D. 1

Honorable Calvin K.Y. Say  
Speaker, House of Representatives  
Twenty-Fourth State Legislature  
Regular Session of 2008  
State of Hawaii

Sir:

Your Committee on Energy & Environmental Protection, to which was referred S.B. No. 2849, S.D. 1, entitled:

"A BILL FOR AN ACT RELATING TO AGRICULTURAL LANDS,"

begs leave to report as follows:

The purpose of this bill is to preserve and provide sustainability to the state's agricultural lands by:

- (1) Clarifying that community plantation subdivisions (CPS) refer to established subdivisions and include agricultural support buildings;
- (2) Deleting the requirement that the sugar or pineapple plantation must be in residential use;
- (3) Providing that existing structures on CPSs must be used, rehabilitated, or increased for use within the scope of the CPS statutory provisions; and
- (4) Requiring that employee housing be rented at affordable rates for agricultural workers and that agricultural support buildings must be rented to agricultural business operators or support services.



The Hawaii Farm Bureau Federation, Hawaiian Electric Company, Maui Electric Company, Hawaii Electric Light Company, Hawaii Agriculture Research Center, and Pacific West Energy, LLC, testified in support of this bill. The Department of Agriculture supported the intent of this measure. The Office of Planning, City and County of Honolulu Department of Planning and Permitting, and Hawaii's Thousand Friends provided comments.

This bill's scope addresses structures in plantation community subdivisions and agricultural-energy facilities on agricultural lands. Your Committee requests the Committees on Water, Land, Ocean Resources & Hawaiian Affairs and Agriculture to exercise their expertise in reviewing and further amending, if necessary, the provisions relating to plantation community subdivisions.

Your Committee has amended this bill by:

- (1) Amending its purpose section to increase the scope of the bill by including existing structures on CPSs and the use and rehabilitation of employee rental housing and agricultural support buildings;
- (2) Deleting the language that allows existing structures on CPSs to be increased in size or scope;
- (3) Clarifying the types of renewable energy generated, stored, or distributed by an agricultural-energy facility; and
- (4) Making technical, nonsubstantive amendments for clarity, consistency, and style.

As affirmed by the record of votes of the members of your Committee on Energy & Environmental Protection that is attached to this report, your Committee is in accord with the intent and purpose of S.B. No. 2849, S.D. 1, as amended herein, and recommends that it pass Second Reading in the form attached hereto as S.B. No. 2849, S.D. 1, H.D. 1, and be referred to the Committees on Water, Land, Ocean Resources & Hawaiian Affairs and Agriculture.



Respectfully submitted on  
behalf of the members of the  
Committee on Energy &  
Environmental Protection,

*Hermína Morita*

HERMINA MORITA, Chair







who performs or has performed a substantial role in the upbringing of the child, the trauma can be greatly reduced.

"In addition, *hanai* relatives have a history with the family and can provide stability for the child. In the cases where the child must be, for whatever reason, separated from their blood relatives for a significant period of time, placing the child with a *hanai* relative will permit the child to maintain their familial connections in a safe and healthy environment.

"In the end, this bill strengthens the social and family safety net for children. It is often quoted that "it takes a village to raise a child." This bill demonstrates that Hawaii does not merely pay lip service to that ideal, but rather takes active steps to ensure that *hanai* relatives, the village the child belongs to, is given the opportunity to care for the child when the blood relatives are not able to."

The motion was put to vote by the Chair and carried, and the report of the Committee was adopted and S.B. No. 2730, SD 2, HD 2, CD 1, entitled: "A BILL FOR AN ACT RELATING TO CHILD PROTECTION," passed Final Reading by a vote of 50 ayes, with Representative Nakasone being excused.

Conf. Com. Rep. No. 19-08 and S.B. No. 2849, SD 1, HD 1, CD 1:

Representative Caldwell moved that the report of the Committee be adopted and that S.B. No. 2849, SD 1, HD 1, CD 1, pass Final Reading, seconded by Representative B. Oshiro.

Representative Thielen rose to speak in opposition to the measure, stating:

"Thank you, Mr. Speaker. I'm rising to speak against this measure. The intent of the bill is very good; it is to permit the use of lands in agricultural land districts for agricultural energy facilities when the production, storage and distribution of renewable energy are integrated with the agricultural activity.

"My concern and my opposition are on two points. One is I don't support our enhancing a biofuel industry here because I believe our agricultural land should be used for food. I think you'll see the impact internationally from other countries which have gone and jumped on to the biofuels craze, the mainland U.S. as well, and what the impact is on the food source. Possibly the empty shelves at Costco where rice has now been hoarded is one of the results of all of this disproportionate attention to biofuels.

"But the more troubling one is in section 3, paragraph 12, where new employee housing and agricultural buildings may be allowed on the land. My concern is if we are going to allow this housing, it could be a very slippery slope toward a housing development where the agricultural facility goes out of operation, such as like DelMonte did. Then you're left with the housing there and there's no limit on the specific number of houses that can be built. So I think there are two things in the bill that make me uncomfortable enough that I'm voting no. Thank you."

Representative Morita rose in support of the measure and asked that her written remarks be inserted in the Journal, and the Chair "so ordered."

Representative Morita's written remarks are as follows:

"Mr. Speaker, I rise in support of this measure. I would like to address some of the concerns and objections to this measure that were raised by the Representative from Kailua. First of all, some of the objections focused on the growing and processing of biofuels. The growing and processing of biofuels is an outright allowable use on agricultural lands. What this measure attempts to clarify is that a renewable project, such as a solar project, that is

integrated within an agricultural enterprise shall be an allowable use.

"The purpose section of this measure states that increased energy efficiency and use of renewable energy resources would increase Hawaii's energy self-sufficiency, achieving broad societal benefits, including increased energy security, resistance to increases in oil prices, environmental sustainability, economic development, and job creation.

"To shape Hawaii's energy and agricultural future and achieve the goal of energy and food self-sufficiency for the State, our efforts must continue on all fronts, integrating new and evolving technologies, seizing upon opportunities to become more economically diversified, and providing incentives and assistance to address barriers. It is crucial to address the negative impacts that rising and volatile petroleum prices have on fuel and fertilizer costs.

"The other objection that was raised is biofuel crops will compete with food crops. While this might be the case in some parts of the nation, this surely is not the case in Hawaii where thousands of acres of agricultural lands lie fallow at the present time. How we plan for our agricultural bio-energy future is an important strategy that must be carefully planned, therefore the bio-energy master plan initiated by the Legislature last year is a critical component to this discussion. One of the objectives of the master plan is to ensure that energy crops will not be pitted against food production as both energy and food self-sufficiency are equally important goals for Hawaii's residents.

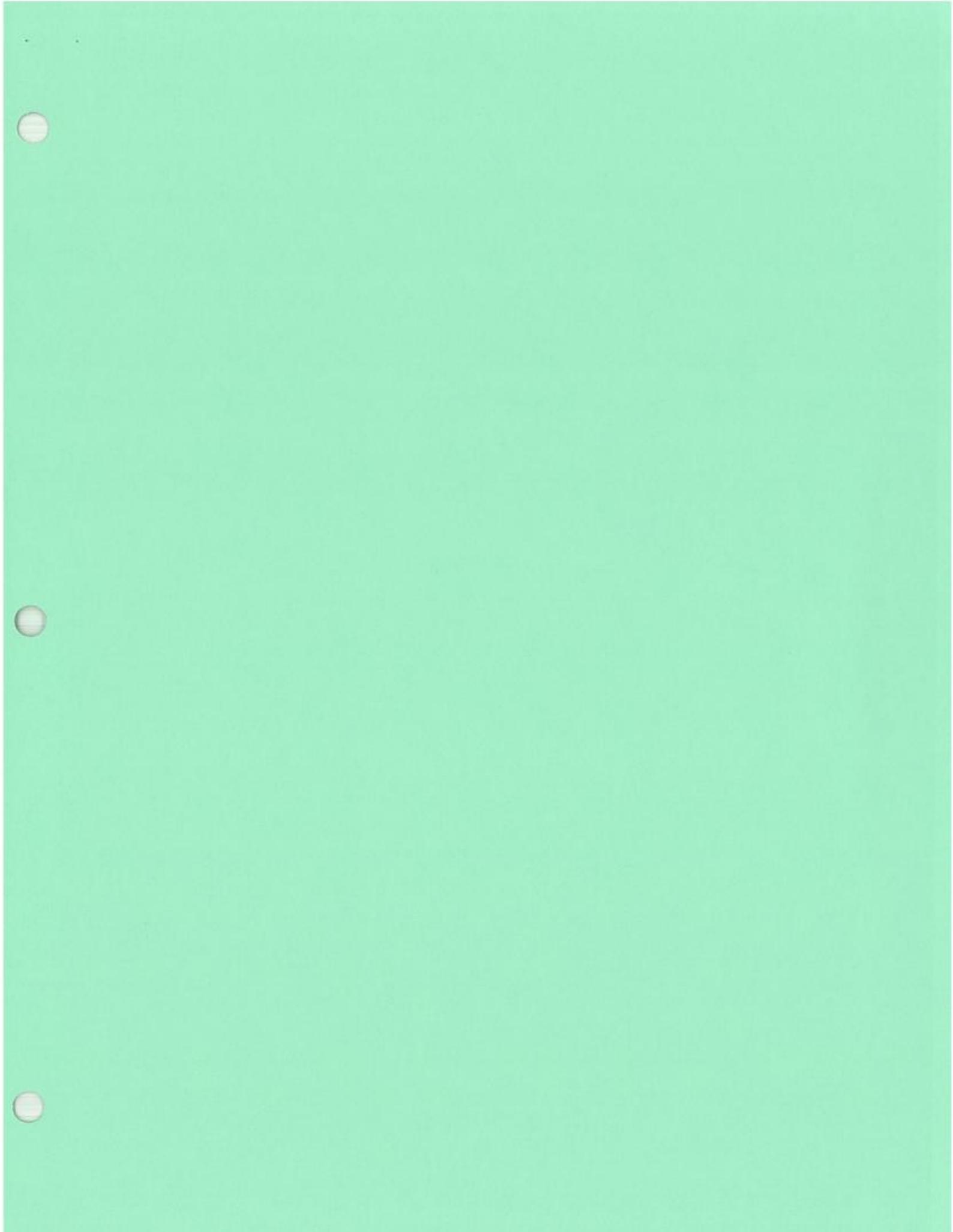
"Finally, Mr. Speaker, the Representative from Kailua also had concerns regarding the language which allows for workers' housing on agricultural lands. This measure allows existing structures on plantation community subdivisions to be used or rehabilitated for employee rental housing at affordable rates for agricultural workers and agricultural support buildings for agricultural business operators and support services. Mr. Speaker, this measure is very restrictive limiting this kind of development, which is intended to support agriculture, to the existing footprint of these types of structures on land currently or formerly owned, leased or operated by a sugar or pineapple plantation. I do not believe you will find the types of abuses we have seen with "gentlemen" farms allowable under the restrictive language of this bill."

Representative Caldwell rose to speak in support of the measure, stating:

"Mr. Speaker, in support with very brief comments. Anyone who drives around any of our major islands will see that the vast majority of agricultural lands lie fallow after the closure of our plantations, whether they be sugar or pineapple. It's not growing anything, but developers are looking to grow houses on it. This is about trying to save our agricultural lands and do something productive with it. If the day comes where it's competing with food production, we can worry about that.

"As far as agricultural housing, anyone who lives on a Neighbor Island, maybe it's not a problem here, but go live on the Big Island and see how long it takes to get from one place to another. You want to live close to where you're working, and those in the fields. It's about helping those workers and not making them drive long distances and pay for gas that's going through the roof that we're trying to get ourselves from being dependent on. It's a good bill. I hope our Members will support it. Thank you."

The motion was put to vote by the Chair and carried, and the report of the Committee was adopted and S.B. No. 2849, SD 1, HD 1, CD 1, entitled: "A BILL FOR AN ACT RELATING TO AGRICULTURAL LANDS," passed Final Reading by a vote of 49 ayes to 1 no, with Representative Thielen voting no, and with Representative Nakasone being excused.



**AGRICULTURAL PLAN FOR TMK NO. (1) 8-5-019: 014 (POR.) AT  
85-485C WAIANAE VALLEY ROAD, WAIANAE, OAHU**

**BY VICTOR BHATTI,  
PRESIDENT, BETEL GARDEN LLC**

**CULTIVATION OF BETEL (*PIPER BETLE*) UNDER RAISED PHOTOVOLTAIC PANELS  
AS AN AGRICULTURAL ENERGY FACILITY / AGRIVOLTAIC SYSTEM  
JANUARY 2016**

I am a bona fide farmer. I have been involved in agricultural business for over twenty years. Initially I was purchasing agricultural products, such as curry leaves and betel leaves, from others, and exporting those crops, but I found that I could not find reliable and sufficient supplies. Therefore, approximately seven years ago I started my own farming operations. Betel Garden LLC is a Hawaii limited liability company and I am its manager.

The betel vine produces leaves that are used as one of the ingredients in the "betel nut" chewing concoction. The Betel (*Piper betle*) is the leaf of a vine belonging to the Piperaceae family. It is valued both as a mild stimulant and for its medicinal properties. The leaves are also a mainstay in most traditional Indian wedding ceremonies signifying freshness and prosperity. I sell betel leaves to a large Indian market, as well as throughout the United States.

I had a successful farming operation on the island of Hawaii for four years, but the land costs were high and I was not able to meet market demand in a way that was financially feasible. Currently I have a 3-acre farm at Punaluu Valley Road in Hauula where I grow betel leaves and curry trees, and I recently acquired a 5-acre farm in Kahuku. However, these locations are not ideal for betel and curry plants due to the wet climate. In addition, as with all small farmers, maintaining a positive cash flow while paying for these properties and installing the infrastructure necessary for these properties, is a constant challenge.

I am enthusiastic about expanding my operation on Oahu, and the 2-acre portion of the above-referenced property (the Farm Site) provides me with an excellent opportunity. The photovoltaic panels and framework that will be installed at no cost to me will create an ideal environment to grow betel vine. In addition to creating shade and angled sunlight at a sufficient height, the solar structure means that I can maximize the crops at this site because the vines will grow horizontally between the posts that support the panels, and climb up those posts, resulting in a greater yield than would be possible otherwise. I will not have to incur costs to install framework on the Farm Site. Instead the Farm Site will be provided to me in a condition that is ready for farming.

This Farm Site is also ideal due to climate/soil temperature. However, a significant feature of this Farm Site is that I have been assured that I can maintain my farming operation on a long-term basis (20+ years), as long as the Farm Site is kept active, and that I will not be charged any rent for the Farm Site. This situation means that I will not have a cash flow issue at

this Farm Site, which in turn means that I have more opportunity to pursue additional farming elsewhere while at the same time making active farming use of the Farm Site.

I. **SITE DESCRIPTION**

The Farm Site consists of 2 acres within the 5.27 acre property located in the Waianae Valley on the island of Oahu, identified by TMK No. (1) 8-5-019: 014. The property address is 85-485C Waianae Valley Road, Waianae, Hawaii 96792.

The property is generally unimproved. There are no structures within the 2-acre Farm Site. The only buildings on the property are a 540-square foot covered work shed, a 110-square foot storage shed, and an approximately 1,400 square feet 2-bedroom, 2-bathroom residence located on the northwest corner of the Property. None of these structures are within the Farm Site. There are some small shade trees surrounding the existing work shed, as well as some small trees along the northwest edge of the property.

The property in the State Land Use Agricultural District and is zoned by the City and County of Honolulu as AG-2 General Agriculture District. It has not been used for agricultural purposes in several years, and the landowner indicated that future agricultural uses are not viable due to declining health and age.

The 2-acre Farm Site has a declining topography of approximately two feet from the southeast or rear toward the northwest or front of the Farm Site. A drainage canal is located to the southeast, and outside of the property. The Property lies in flood zone "D" on the FEMA Flood Insurance Rate Map Panel 15003C0185G.

II. **AGRICULTURAL SUITABILITY**

The 2-acre Farm Site is currently fallow, but has good potential for productive agricultural use.

A. **Soil Types.**

The Land Study Bureau detailed land classification overall (master) productivity rating classification of the soils within the Farm Site is "A". The ALISH classification of the Farm Site is Prime.

For the desired crop, betel vine, the soils are excellent due to the heat and dry climate in Waianae. Warm soils are important for this crop.

The soils are Lualualei-Fill land-Ewa Association. The Lualualei-Fill land-Ewa Association consists of well-drained, fine textured and moderately fine textured soils on fans and in drainage ways on the southern and western plains on Oahu. The elevation ranges from sea level to 400 feet. The mean annual soil temperature is between 73 to 75 degrees F. Lualualei soils have a surface layer of very dark grayish-brown, very sticky and very plastic clay that cracks upon drying. The Ewa association has been used for sugarcane, truck crops and pasture. The

soils are nearly level to moderately sloping, well-drained soils that have fine textured or moderately fine textured subsoil or underlying material, and areas of fill land, on coastal plains. See U.S. Department of Agricultural Soil Conservation Service, "Soil Survey of Islands of Kauai, Oahu, Hawaii, Molokai, and Lanai, State of Hawaii" (1972). Solar radiation: 500+ cal/sq cm/day

Soil Series: Pulehu clay loam, 0 to 3 percent (PsA). This soil is underlain by dark-brown, dark greyish-brown and brown, massive loam, and silt loam about 39 inches thick. Below this is coarse, gravelly or sandy alluvium. The soil is neutral in the surface layer and neutral to mildly alkaline below the surface layer. pH: 6.5 to 7.5 (Soil Survey Territory of Hawaii, Series 1939, No. 25, Sept. 1955, USDA). Temperature: 61.0 (75.8) 91.0 °F [min. (avg) max. for 2012] Elevation (ft): 40 to 45. "This is the best soil of the Pulehu series."

B. Temperature.

Temperature data from the three nearby weather stations has been collected. The averages as of June 2013 are:

MD3665 (temp. 73 - 81, avg. 77.6)  
Nanakuli HI US, Waianae, HI  
Lat: N 21 ° 23 ' 33 " (21.393 °) or 4.30 miles from project site.  
Lon: W 158 ° 8 ' 56 " (-158.149 °)  
Elevation (ft): 49  
Humidity 61 - 81, avg 67

MMKRH1 (temp. 87 - 71, avg 79.6)  
MAKUA RANGE HI US, Waianae, HI  
Lat: N 21 ° 31 ' 42 " (21.529 °) or 6.35 miles from project site.  
Lon: W 158 ° 13 ' 33 " (-158.226 °)  
Elevation (ft): 19  
Humidity 78 -54, avg 66

MWNVH1 (temp. 70 - 83, avg. 75.6)  
WAIANA VALLEY HI US, Waianae, HI  
Lat: N 21 ° 28 ' 50 " (21.481 °) or 2.55 miles from project site.  
Lon: W 158 ° 9 ' 17 " (-158.155 °)  
Elevation (ft): 865  
Humidity 53-84, avg 67

C. Rainfall.

Waianae has had an average rainfall of 24.59 inches over the last 30 years. Local climatic conditions are typical for leeward O'ahu areas. The amount of rainfall in the Wai'anae Mountain Range is much lower than in the Ko'olau Range, resulting in a hot, sunny and dry climate on the coast and somewhat wetter conditions at higher elevations. The average annual

rainfall in this area ranges from 21 inches at the coast to 79 inches near the summit of Mount Ka'ala (Giambelluca, et al., 2012).

### III. SELECTED CROPS AND CROP SUITABILITY

As mentioned above, the betel vine produces leaves that are used as one of the ingredients in the "betel nut" chewing concoction. The leaves are also a mainstay in most traditional Indian wedding ceremonies. In addition, Piper betle L. has been use in Chinese and Indian traditional medicine for centuries.

<p><b>Plant Profile: Taxonomical classification</b></p> <p>Kingdom Plantae Division: Magnoliphyta Class: Magnolipsida Order: Piperales Family: Piperaceae Genus: Piper Species: betel</p>	
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The betel plant produces harvestable leaves throughout the year, for 10 to 15 years, starting about 12 months after planting. Harvest from a single plant is from two or three times a week, but is expected to be spread out to six days per week for the whole plot.

Chewing betel leaves produce a sense of well-being, increased alertness, sweating, salivation, hot sensation and energetic feeling with exhilaration. The leaves are very nutritive and contain substantial amount of vitamins and minerals. Six leaves with a little bit of slaked lime (limewater) is said to be comparable to about 300 ml of cow milk particularly for the vitamin and mineral nutrition. (Betel Leaf: The Neglected Green Gold of India, J. Hum. Ecol., 19(2): 87-93 (2006)). The nutritional composition of fresh betel is shown in the table below.

Nutritional composition of fresh Piper betle			
Constituents	Approximate composition	Constituents	Approximate composition
Water	85 - 90%	Riboflavin	1.9 - 30 µg/100g
Protein	3 - 3.5%	Tannin	0.1 - 1.3%
Fat	0.4 - 1.0%	Nitrogen	2.0 - 7.0%
Minerals	2.3 - 3.3%	Phosphorus	0.05 - 0.6%
Fiber	2.3%	Potassium	1.1 - 4.6%
Chlorophyll	0.01 - 0.25%	Calcium	0.2 - 0.5%
Carbohydrate	0.5 - 6.10%	Iron	0.005 - 0.007%
Nicotinic acid	0.63 - 0.89 mg/100g	Iodine	3.4 µg/100g
Vitamin C	0.005 - 0.01%	Essential Oil	0.08 - 0.2%
Vitamin A	1.9 - 2.9 mg/100g	Energy	44 kcal/100 g
Thiamine	10 - 70 µg/100g		

#### IV. COMPATIBILITY WITH PHOTOVOLTAIC USES

The Farm Site will also be used both to grow betel vine and to generate solar energy through photovoltaic panels (PVP). The PVP infrastructure will create an optimum environment for growing betel vine. The PVP panels and posts will be integrally incorporated into the farming that I will be doing.

The PVP system will leave 99% of the ground area within the Farm Site available for my crops. Approximately 456 small dimension concrete posts will be installed, each using 0.7854 square feet of land area, resulting in a total of 358.1424 square feet of ground coverage within the entire 87,120 sq ft Farm Site.

The Farm Site is 2 acres, or 87,120 sq. ft. Almost the entire 2-acre Farm Site will be available for my agricultural operation. The usable area for farming within the 2 acre/87,120 sq ft Farm Site will be more than 86,120 sq ft. That is based on the following: (a) concrete posts = 358.14 sq ft unusable land; (b) concrete slab = 400 sq ft; (c) total unuseable land area within Farm Site = 758.14 sq ft; (d) total usable land area within Farm Site = 86,361.86 sq ft.

The posts will be topped by photovoltaic panels that will be set on an angle. At the lowest point, the bottom of the PVP will be approximately 7 feet above ground, and at the highest point will be approximately 11 feet above the ground. The rows of PVP will be spaced approximately 12 feet apart. This spacing is wider than the typical solar farm. This spacing will allow sunlight to reach the areas underneath the PVP. As the sun moves from east to west, sunlight will fall within the areas under the PVP.

The concept of mixing crops and solar photovoltaic production is not new, but it is not well known in Hawaii. These mixed-use systems are called "Agrivoltaic Systems" (AVS) which is defined as "mixed systems associating solar panels and crop at the same time on the same land area." The PVP create intermittent shading for the crops that grow underneath the PVP. According to Keith Cronin, founder of SunHedge, a solar consultancy company, the PVP "provides an 11-13% light transmittance, depending upon a portrait or landscape layout."

This method of blending farming and energy production eliminates the problems that arose when biofuels started to be grown. Such crops replaced food and other consumer crops and used up vast tracts of land. Using agricultural land to grow biofuels to feed energy generation systems means that agricultural land is no longer available for small farmers like me. See enclosed article by Courtney White.

Agrivoltaic systems (the combination of crops and photovoltaic panels) have been shown to be more productive than typical crop production. The Land Equivalent Ratio (LER) of AVS has been found to be 1.3 to 1.6. See Dupraz, C., Marrou, H., Talbot, G., Dufour, L., Nogier, A., Ferad, Y., *Combining solar photovoltaic panels and food crops for optimizing land use: towards new agrivoltaic schemes*, RENEW. ENERGY 36 (2011), 2725-2732.

A LER of 1.1 would mean that an AVS was equally as productive as a non-AVS crop production. Therefore, a LER of 1.3 means that an AVS farm of 2 acres produces as much as a 2.6 acre traditional farm; a LER of 1.6 means that an AVS farm of 2 acres produces as much as a 3.2 acre traditional farm. The shading provided by an AVS is more efficient than tree shading because the PVP do not compete with the crops for below-ground resources.

When a plant receives less light than normal, it characteristically responds by growing larger leaves. The size and shape of leaves is an example of a compromise between leaf energy exchange, leaf temperature, and photosynthesis. Leaves growing in sunny environments are smaller and more deeply lobed than leaves growing in shaded environments. Leafy plants growing in the hot, arid environment of deserts or cold arctic and alpine environments have small leaves. In part, this is related to the influence of leaf dimension on leaf boundary layer resistance and the efficiency with which heat and moisture are transported away from a leaf. Large leaves have a thick boundary layer and inefficient heat transfer. This information is found in *Ecological Climatology* (2nd edition, 2008) by Gordon Bonan, Chapter 9 (Leaves and Plants). In the case of betel vine, partial shade is perfect because the desired agricultural commodity is the betel leaf.

As is evident in the picture on the following page, the betel vine requires shade, which the raised PVP will provide. Betel leaf turns yellow, instead of the desired glossy green, when it gets too hot and has too much direct sunlight. Shading is very important. Here, a waist-high, lattice framework will be constructed down the length of each PVP array. Wire mesh will be secured onto the top surface of the framework. Betel plant will be planted under the lattice every four feet down the length of the frame. The vine will grow vertically up to the wire mesh then horizontally to cover the mesh.



Lettuce is another shade tolerant plant that could grow well in an Agrivoltaic system, and arugula, Asian greens, chard collard greens, kale, mustard greens, parsley, sorrel, spinach and scallions may also do well in this environment. A copy of *The potential of Agrivoltaic systems*, Renewable and Sustainable Energy Reviews, 54, 299-308 (2016), is enclosed.

#### V. **BEST MANAGEMENT PRACTICES AND PESTICIDE USE**

Prior to planting the vines I will collect soil samples to determine the nutrient requirements sufficient for betel vine, in order to ensure that only the type and amount of fertilizer needed for optimum growth and production are applied. Soil sampling can be conducted by BEI Hawaii, which is Hawaii's leading distributor of agricultural and industrial chemicals, fertilizer and specialty products.

I intend to use sustainable and environmentally protective methods when farming. I will use organic fertilizers and organic pesticides. Pesticide use would be limited to once a month, or less often (once every 4 - 6 weeks) to control insects that may be attracted to the betel leaf. BEI Hawaii sells organic fertilizers and crop protection products.

Mulch and ground covers will be used to minimize moisture loss caused by the wind and to add organic matter to the soil. All two-acres of the Farm Site will be covered in ground cover, which reduces moisture loss, and also prevents weeds from growing.

## VI. IRRIGATION WATER REQUIREMENT

Water will be applied in a drip and mini sprinkler irrigation system that is closely monitored and controlled by computers to eliminate any waste of water. Sprinklers can be regulated so that drop size is large and the sprinklers are placed near the soil level to prevent loss of water from wind. The betel vine requires minimal water. Fifteen to twenty minutes a day via sprinkler system is sufficient.

The existing water meter for the site, serviced by the City and County of Honolulu Board of Water Supply, is adequate for the agricultural uses at the Farm Site, and provides water at agricultural rates. (Before aging out of farming, the landowners grew bok choy and green onions on the property).

## VII. ALTERNATIVE CROPS

My intention is to grow betel vine at the Farm Site. However, I have experience producing mint, turmeric, curry leaves, moringa leaves and pods and rosemary. At this Farm Site, instead of betel vine, I could grow curry trees (and will likely plant some curry trees around the perimeter of the Farm Site).

Similar to the betel vine, the target crop with curry trees is the leaf. Though the trees can grow 13 to 20 feet tall, they will be periodically coppiced to facilitate the harvest of the leaves (and keep the trees from shading the PVP). The very aromatic "curry leaves" are used as a seasoning in many, especially Indian, dishes. As with many seasonings, curry leaves have a short shelf life when fresh and lose their potency upon drying. Therefore, a supply of fresh curry leaves is highly desirable. However, my intention is to grow betel vine as the primary crop at the Farm Site.

## VIII. ECONOMIC SUMMARY OF CROPS

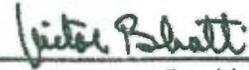
Having a farming operation at this Farm Site is particularly beneficial because it is in close proximity to the Pa'ina Gray\*Star Genesis Underwater Cobalt-60 Irradiator located in Kunia. Treatment at the Irradiator is required before the leaves can be shipped to the continental United States. Oahu also offers the added advantages of having more frequent airline flights to the mainland which translates into ensuring product freshness and adding flexibility in scheduling harvests. The greater number of mainland destinations opens up additional markets. Currently I send betel leaf all over the United States and also work with a large Indian food exporter.

An added incentive to running an agricultural operation at this Farm Site is that I can be assured that the property will remain available to me for the duration of the PVP uses on the property. In this case, the farming and the PVP go hand in hand. The lessee of the Farm Site has an agreement with Hawaiian Electric to supply solar power for at least 20 years. That means that I am in the uniquely advantageous position of having a long-term right to use this Farm Site. There is no chance that I will be asked to leave due to land speculation.

An additional advantage is that the combined agricultural/PVP use of the Farm Site means that I will have rights to use this Farm Site without the burden of paying lease rent. My land costs will be limited to paying for water to support the agricultural activities. Not only will this ensure that farming on this site remains viable for at least the next 20 years, it means that I have the financial flexibility to take a chance on cultivating other crops on less predictable sites because my carrying costs for this Farm Site will be so low, and the demand for betel leaf is so strong.

January 28, 2016

Victor Bhatti



President

Betel Garden LLC