HB2636 HD2

Measure Title:	RELATING TO SOLAR ENERGY FACILITIES.
Report Title:	Solar Energy Facilities; Agricultural Districts
Description:	Requires a county that meets certain conditions to require solar energy facilities in farm dwellings in agricultural districts with a capacity of more than twenty-five kilowatts to obtain a special permit. (HB2636 HD2)
Companion:	
Package:	None
Current Referral:	PSM/TRE, WAM
Introducer(s):	CREAGAN

OFFICE OF PLANNING
STATE OF HAWAII

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DAVID Y. IGE
GOVERNOR

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Statement of
LEO R. ASUNCION
Director, Office of Planning
before the
SENATE COMMITTEE ON PUBLIC SAFETY, INTERGOVERNMENTAL, AND MILITARY AFFAIRS
AND
SENATE COMMITTEE ON TRANSPORTATION AND ENERGY

Thursday, March 17, 2016
3:00 PM
State Capitol, Conference Room 229

in consideration of
HB 2636, HD 2
RELATING TO SOLAR ENERGY FACILITIES.

Chairs Nishihara and Inouye, Vice Chairs Espero and Gabbard, and Members of the Senate Committees on Public Safety, Intergovernmental, and Military Affairs, and Transportation and Energy.

The Office of Planning (OP) respectfully opposes HB 2636, HD 2, which would allow a county that meets certain conditions to require a special permit approval process for solar energy facilities with a capacity of more than 25 kilowatts.

OP recognizes that HB 2636, HD 2 seeks to restrict the proliferation of non-agricultural uses in the Agricultural District, and make it more difficult to develop dispersed solar facilities in the Agricultural District. We do not, however, support the narrow and targeted application of this bill, which appears to be in response to a proposed solar facility installation in a subdivision in the County of Hawaii.

Furthermore, OP does not believe that this is the most appropriate vehicle for restricting such non-agricultural. Rather, a more comprehensive land use process reform is needed, which has statewide application and a more thorough understanding of the associated impacts of the proposed change. As written, this bill may have unintended adverse impacts.

OP also notes that HB 2636, HD 2 proposes to amend only Hawaii Revised Statutes (HRS) Chapter 205 Section 205-2, but because the bill would apply to all lands within the Agricultural District, Section 205-4.5, which addresses permissible uses within the Agricultural District, would also need to be amended accordingly.

Thank you for the opportunity to testify on this matter.

DAVID Y. IGE
Governor

SHAN S. TSUTSUI
Lt. Governor

SCOTT E. ENRIGHT
Chairperson, Board of Agriculture

PHYLLIS SHIMABUKURO-GEISER
Deputy to the Chairperson

State of Hawaii
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TESTIMONY OF SCOTT E. ENRIGHT
CHAIRPERSON, BOARD OF AGRICULTURE

BEFORE THE SENATE COMMITTEES ON PUBLIC SAFETY, INTERGOVERNMENTAL RELATIONS, AND MILITARY AFFAIRS, AND TRANSPORTATION AND ENERGY

March 17, 2016
3:00 P.M.
CONFERENCE ROOM 229

HOUSE BILL NO. 2636 HD2
RELATING TO SOLAR ENERGY FACILITIES

Chairpersons Nishihara and Inouye and Members of the Committees:

Thank you for the opportunity to testify on House Bill No. 2636 HD2 that amends Section 205-2 to require special permit approval for solar energy production equipment within the Agricultural District in the county of Hawaii that are placed on single or multiple lots possessing specific characteristics or situations, including being non-conforming subdivisions, prior to January 1, 2016. The Department of Agriculture has strong concerns about this measure.

This measure, as written, may result in unintended adverse consequences on the special permit process and the Agricultural District. The Land Use Commission, in its testimony on HB2636 HD1, described the specific area that this bill is targeting as being "…primarily residential subdivision within the State Agricultural District on the island of Hawaii." (Testimony dated February 22, 2016). We understand that residential dwellings are not allowed in the Agricultural District unless they are "…located on and used in connection with a farm … or where agricultural activity provides income to the family occupying the dwelling." (Section 205-4.5(a)(4)) . The specific area has Land

Study Bureau Overall Productivity Ratings of “E” and “D”, and according to Chapter 205, solar energy facilities are a permitted use (Section 205-2(d)(6)).

We understand special permits are considered for “certain unusual and reasonable uses within the agricultural district…other than those for which the district is classified.” (Section 205-6(a)). HB 2636 HD 2 identifies an area in the Agricultural District with certain characteristics including that of being a “non-conforming subdivision”, where a solar energy facility, a permitted use, is proposed to be built on multiple parcels and made subject to special permit approval. Therefore, the benefit of the application of this measure as written would be to the non-conforming residential uses and not bona fide agricultural activities. The Department has strong concerns about using the special permit process in this manner.

. Thank you for the opportunity to submit our testimony.

From: mailinglist@capitol.hawaii.gov
To: PSMTestimony
Cc: kemuelle@att.net
Subject: Submitted testimony for HB2636 on Mar 17, 2016 15:00PM
Date: Monday, March 14, 2016 4:36:29 PM

HB2636
Submitted on: 3/14/2016
Testimony for PSM/TRE on Mar 17, 2016 15:00PM in Conference Room 229

Submitted By	Organization	Testifier Position	Present at Hearing
Kerstin Mueller	Individual	Support	No

Comments: I support HB2636 HD2 because it closes a loophole in HRS 205-2, the law that allows huge solar installations in residential areas.

Please note that testimony submitted less than 24 hours prior to the hearing, improperly identified, or directed to the incorrect office, may not be posted online or distributed to the committee prior to the convening of the public hearing.

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From: mailinglist@capitol.hawaii.gov
To: PSMTestimony
Cc: stroeller@gmail.com
Subject: Submitted testimony for HB2636 on Mar 17, 2016 15:00PM
Date: Monday, March 14, 2016 8:05:21 PM

HB2636
Submitted on: 3/14/2016
Testimony for PSM/TRE on Mar 17, 2016 15:00PM in Conference Room 229

Submitted By	Organization	Testifier Position	Present at Hearing
Stanley Troeller	Individual	Comments Only	No

Comments: I support HB 2636 HD2 as it closes the lope hole in HB HRS 205 2, the law that allows solar installations in residential areas. We live in Hawaiian Ranchos, on the Big Island, Kau side. Richard Creagan our Rep. has it passed the house now. The proposed solar project should never have been permitted, as we are in a small residential area. Thanks for your consideration. Stanley Troeller Resident , Hawaiian Ranchos Sudivsion,Big Island.

Please note that testimony submitted less than 24 hours prior to the hearing, improperly identified, or directed to the incorrect office, may not be posted online or distributed to the committee prior to the convening of the public hearing.

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PETER AND ANN BOSTED
P. O. BOX 6254, OCEAN VIEW, HI 96737

16 March, 2016

Senator Clarence K. Nishihara.
Chairman,
Committee on Public Safety, Intergovernmental & Military Affairs,
Hawai'i State Capitol.

Aloha Chair Nishihara, Vice Chair Espero, and Committee Members,

REQUEST FOR SUPPORT FOR HB 2636 HD2

We are writing to request that you support HB 2636 HD2 that amends HRS 205-2.

We are in favor of the bill as it will, in the future, stop the construction of large solar installations in many rural communities. Mixing homes with industrial-scale solar power is harmful to the public health and safety (fires, air and ground water pollution, excessive dust), bad for business, and not in the interests of residents who value their rural lifestyle and homes.

BACKGROUND

This bill amends HRS 205-2, which is an amendment of Chapter 205. Chapter 205 was enacted in 1961 and classifies all land in the state of Hawai'i into one of four districts, namely urban, rural, agricultural and conservation. The Legislature amended 205 with 205-2 which would allow the construction of solar power facilities on agricultural land without a special use permit. Please note – the legislature did NOT allow solar installations to be built on conservation, rural or urban without a permit. From this we can plainly see that it was the legislature's intention that solar should not be mixed with conservation, rural or urban. The Special Use Permit requirement was eliminated so that potential solar producers would be encouraged to enter the Feed-in-Tariff (FIT) program and apply for permits.

While HRS 205-2 appears to be a good law (especially to those of us who appreciate the many benefits of solar energy) in that it allows solar installations on poor agricultural land, it has proved to be a well-intended law with unforeseen consequences. It threatens all non-conforming (old) subdivisions because they are zoned ag. even though they are clearly used for residential. There are scores of such subdivisions on the Big Island. The town of Ocean View has seven subdivisions that are all considered to be non-conforming as they do not and cannot conform to present day county subdivision zoning standards.

However, this bill is NOT only about the Ocean View situation as its critics allege. The district of Puna, near Hilo, has many huge non-conforming subdivisions, such as Hawaiian Acres, Eden Roc, Fern Forest, Hawaiian Paradise Park, Hawai'i Beaches Estates, Aino Loa Estates, Orchid Land Estates, Leilani Estates, Nanawale Estates, Vacation Lands, Kalapana Black Sands, Kalapana Gardens and Kalapana Sea View Estates. Any one of these could fall victim being industrialized.

Although this is an island-wide zoning anomaly that defies common sense, it is not widely known, and is the basis for an unintentioned decision to locate a utility-scale solar installation in a housing neighborhood.

When testifying before the House Committee on Energy and Environmental Protection on Feb 4, concerning this bill, Daniel E. Orodenker, Executive Officer of the Land Use Commission stated:

"Residential subdivisions are not allowed in the State Agricultural District under Chapter 205, HRS."

It is not our intention to criticize Mr. Orodenker, but rather to use his testimony to illustrate how easy it was for legislators to not consider non-conforming subdivisions. They made a mistake, but it was a very easy one to make. The upshot is that HRS 205-2 now has a loophole that allows huge industrial-scale solar developments in residential subdivisions.

HRS 205-2 does not make allowances for housing subdivisions that are zoned agricultural.

THE PROBLEM

In June of 2015 Hawai'i Electric Light Company (HELCO) informed residents of Ocean View that a new sub station would be built to serve 25 solar farms planned for the town. The audience was angered and dismayed.

Since then
. Over 600 residents have signed a petition against the installations
. Over 300 residents of the largest subdivision, Hawaiian Ranchos, wrote comments and voted against the farms
. The Ka'u Calendar has published more than a dozen stories, none supportive of the solar project.
. *West Hawai'i Today* has published eight articles, many quoting notable energy and conservation professionals who condemn this boondoggle project as being bad for the island and a poor reflection on the Feed-in-Tariff (FIT) program.

The solar developer, a large overseas corporation, SPI Solar (headquartered in Shanghai) intends to build 25 solar installations, each with a capacity of 250kW, on 25 three-acre lots, among homes, in three subdivisions in Ocean View on the Big Island. 16 would go in the

Hawaiian Ranchos sub-division, one in the Kula Kai subdivision, and eight in the Kona South subdivision. (Please see attached map). The last mentioned is completely undeveloped and rich in virgin ‘Ohi’a forest. There is no legal access to the eight lots that SPI plans to lease from the owners. Ocean View is a fast-growing town with about 7,000 residents. Our population doubled between 1990 and 2000, and then doubled again between 2000 and 2010.

SPI Solar is able to industrialize our rural neighborhood by taking advantage of the loophole in HRS 205-2. 30,000 panels will be installed, with a combined output of 6.75 megawatts. Each lot will be bulldozed flat edge-to-edge. Each array will have 1,127 panels. Each array will cover more than two acres and will be surrounded by two six-foot-high chain-link fences with cameras and security lights added. This corporation is able to industrialize our rural neighborhood by taking advantage of a loophole in this law.

Let’s put this proposal in perspective. If we assume that Hawaiian Ranchos Estates, a subdivision of about 1,100 lots, has about 200 homes. If those 200 homes each have a footprint of about 2,000 square feet, then, combined, they cover an area of 400,000 square feet, or 9.2 acres. If built, these PV installations will cover about 60 acres. Thus, in round numbers, for every square foot of existing home, there will be nearly six square feet of PV panels covering the land.

The impact will be enormous. Six times more trees will be felled for a PV site than for a home site. The PV sites will be bulldozed flat from edge to edge, which means no vegetation to keep the dust down. Since no homes will be constructed, no catchment tanks will be installed, so there will be no on-site water to irrigate shrubs or trees. With an annual rainfall of about 9”, very few plants can survive without irrigation. The PV sites will be bare. When it does rain, the runoff will gouge furrows in the unprotected dirt and create erosions scars, which may impact neighboring properties or the roads. However, the PV sites will have to be kept free of weeds, so every three months about 60 acres will be sprayed with weed-killer and the weeds will go ugly brown. We get our water from a county well, so the chemicals will, over a 20-year period, have an adverse effect on our water supply and may make it unusable. Surely these consequences should be of grave concern to the Senate?

With 30,000 panels installed and generating electricity, what are the chances that one, or ten or a hundred will be defective over a 20-year-period? And what if those defective panels, or other pieces of defective electrical components cause a fire? Ocean View is in a desert and the tinder-dry grass and forest make excellent fuel for a wildfire, which, combined with high winds spell disaster.

Solar farm fires are common and problems are numerous (see attachment). Solar installations are typically located in a desert so fires, while a problem, are not a disaster, and if they are not contained promptly, only the solar equipment is destroyed. In Ocean View, the fire fighters are not trained to deal with electrical fires. Ocean View, a town of 7,000 has minimal firefighting staff, equipment, facilities and training. The firefighters are not trained to deal with an electrical fire.

We are not the first to point out the folly of locating PV installations near homes. The internet documents press stories reporting how communities like ours oppose developments like this. The courts are very sympathetic. We think It is inconceivable that the state legislature would deliberately allow industrial solar to be built in residential areas.

INTERESTS

We have many concerns about this project and the FIT program, but the concerns that support the unsuitability of housing land for solar installations include:

1. BAD FOR BUSINESS. The FIT program was originally conceived as a way to get existing owners of agricultural land, such as ranchers and farmers, to earn money from their poor land by building solar installations that would feed power into the grid. In this way the ratepayers would benefit from renewable energy and the land owners would benefit from additional income. Many hurdles and restrictions were taken away in order to make it easier for these small businessmen, and the limit for each permit was set at 250kW.

However, the noble intentions of this program were confounded by SPI Solar. This mega corporation "bought" three-acre lots precisely because they were zoned agriculture and thus qualified for easy development under HRS 205-2. In order to qualify for the "ownership" part of the program, the company hastily entered into sales agreements with all sellers that could be quickly found. In this way, the developer, at that time called "Ohana Solar, LLC" secured 42 permits, and was given 25 places on the FIT's Active Queue. All this was done when SPI Solar was still in Escrow and had no control over the land, in spite of FIT rules to the contrary. (The developer was in Escrow for an average of 349 days on 17 of the lots). (Please see attached table). Clearly Hawaiian owners of *bona fide* agricultural land, such as ranchers and farmers, were the losers, as they were not able to secure any of the 32 FIT permits that were given on a first come, first served basis to Big Island applicants.

The developer wanted the best of both worlds. These housing properties offered the advantages of residential land (three-acre lots) while also adhering to the letter of the law as they are zoned "agriculture". Clearly the developer hoped to increase profits and make the project more saleable by using the town's good roads and three-phase power.

By exploiting this loophole, the developer is proposing to build <u>exactly</u> where the legislators intended to prevent solar installations from being built.

Yet the state is being blamed. We refer to a news story of 5/22/13 entitled "Construction nears for Ka'u solar farm" by Erin Miller. Here the County of Hawai'i puts the blame squarely on the state for the poor change to the zoning law. The Planning Director is reported as saying that county residents can thank state legislators for confounding the zoning laws. (see attached).

At first it seemed that the developer, by slipping through loopholes, had gained a business advantage. Five years later, the downside of forcing unwanted industrialization on a rural community and compromising the FIT program is now becoming apparent.

The developer's poor business decision in choosing a housing community is now obvious. The infrastructure required a lot of work by our power company, HELCO, and it is still incomplete. HELCO must build a new substation, but the site chosen is already in use and there is a cloud over HELCO's supposed easement as the lot was never subdivided. In addition, the developer has no legal access to the leased sites in the Kona South subdivision. In other words, this project is still not "shovel ready" and may never be so. Recently, the PUC opened a docket and held a hearing about the construction of a high-voltage line through a residential neighborhood. If the PUC upholds the concerns of Ocean View's residents, as we believe it should, and the line is not approved, then the project is dead.

If the goals of the FIT program had not been compromised by a vain attempt to put solar in a residential neighborhood, perhaps 32 *bona fide* agricultural land owners would have quickly built solar farms of a manageable size, promptly produced renewable energy and less fossil fuels would have been burned on the Big Island over the last four years, or so. This would have benefitted consumers.

However, if, five years ago, the developer had been required to get a Special Use Permit, the community's concerns would have been voiced then, and the developer would not have wasted time and money on permits for a site that is not workable. Thus, in addition to the farmers and ranchers and owners of *bona fide* agricultural land, and in addition to the families that live on residential land that is zoned "agricultural", the developer who selects housing land for a solar project is also a "loser". This situation is a loose-loose-loose one.

Rep. Dr. Creagan's bill seeks to stop this waste and end poor business decisions that may adhere to the letter of the law, (but are definitely not in the spirit of the law) by essentially banning big utility-scale solar developments in residential neighborhoods and limiting PV systems to 25kW – a generous size for residential family needs.

According to the annual Renewable Portfolio Standard report filed with Hawai`i PUC, Hawai'i island led the state with 48.7 percent of customer electricity use coming from renewable resources in 2015. The island is well ahead of its 2015 RPS goal of 15 percent. While more renewables are always welcome alternatives to oil-burning generators, they are now needed only for the evening hours. The island currently has a surplus of daytime energy, which means that perfectly good, renewable green energy is "curtailed" or turned off each day. This is not good for businesses which have developed, or plan to develop, more solar power generation facilities. Indeed, in October the PUC ended the very popular NEM program whereby commercial and residential ratepayers could install rooftop solar panels and earn night time credits with surplus daytime power production. Further, a huge geothermal power plant is planned, which, when completed, will generate daytime and evening power, thus making huge solar installations less useful.

This bill should appeal to those who are pro-solar, pro-business, pro-consumer and pro-agriculture.

2. PUBLIC SAFETY. A 2006 study commissioned by Hawai'i Volcanoes National Park rated Ocean View as an EXTREME fire hazard, due to the terrain, strong winds, desert climate and lack of preparedness. Ocean View lacks necessary infrastructure. We have TWO fire fighters who have to respond to a wide variety of emergencies over a very large area. Our station is the busiest on the island. It would require significant additional manpower, training and equipment to be prepared for this kind of fire. There have been notable fires originating on solar farms in California and Texas, but as the installations there were in the uninhabited desert, the consequences were not disastrous. Industry does not mix with residential.

3. AESTHETICS. Solar farms are industrial installations in terms of appearance and function and are completely incompatible with homes in a residential neighborhood. We take enormous pride in our homes and ranch-like environment. We enjoy uninterrupted ocean views, extensive 'Ohi'a forests, nature and the clear night sky. These industrial installations will cover over two acres on each three-acre lot, which means each lot will be stripped of trees and bulldozed flat from edge to edge. Each lot will then be surrounded by a six-foot chain link fence and cameras, alarms, and security lights will be installed. This is the opposite of how our neighborhood is currently developed. At present the homes are typically tucked away among trees or blend in with their surroundings.

How would you like to have a two-acre solar farm built next door to you?

We respectfully ask that you find, in this case, that there is a very obvious conflict between the **intentions** of the law and the **letter** of the law. It is the loopholes in the law that are causing problems, and those loopholes need to be closed.

We earnestly ask you to recognize that the legislature's unintentional mistake needs to fixed, not perpetuated. **We ask you to support HB 2636 HD2.**

We need your *kokua*.

Respectfully,

Peter and Ann Bosted
(808) 315-2196

Hawaiian Ocean View Estates Sub-Division
Highway 11
To Kona
Prince Kuhio B.
Kohala B.
Maile Dr.
Bougainvilla
Jasmine Dr.
Macadamia Dr.
Hibiscus Dr.
Jacaranda
Lauhala
Poha Dr.
Tapa Dr.
Menehune Dr.
Lanikai Dr.
NATIVE OHIA FOREST
Rare and endangered plants and species.
Kona-South Estates
An undeveloped sub-division of 22 parcels of 21 acres each, totaling some 500 acres.
8 Kona South lots are listed on the FIT program's active list. There is no legal access to these lots.
Prince Kuhio
Kahili blvd.
Makai Blvd.
Alii Blvd.
Hokulani Blvd.
Kohala Blvd.
Kamaaina
N
Hawaiian Ocean View Ranchos Sub-Division
Sites approved for major 6.25 Megawatt solar project. First phase of development.
3 Acre undeveloped lots
3 acre parcels with homes and improvements.
Existing commercial businesses on 3 acre parcels.

Here are 16 of the potential failures or damages that can occur on a solar farm and how they could impact operations if not addressed in a timely manner.

Anything Can Go Wrong on a Solar Farm

Maureen McHale for ESA Renewables

When it comes to solar power plants, a critical consideration to achieving maximum power output is the ongoing operation and maintenance (O&M) following the commissioning of the system. Although solar installations are highly reliable and designed to run with minimal manpower, efficiency will be lost and energy generation decreased if not maintained properly.

Solar equipment can be kept in service for decades with regular and proper attention to all major and ancillary features; however, many asset managers may not have a handle on what is really needed in the day-to-day operations of a power plant. Undetected failures and small issues impact the overall operations of the system, which leads to lost revenues and lower energy generation compounding with each undetected, unmanaged issue.

16 Potential O&M Issues

Here are 16 of the potential failures or damages that can occur on a solar farm and how they could impact operations if not addressed in a timely manner.

1. Perimeter Fence Damage. Damage caused to the perimeter fence can immediately have a negative effect on facility operations. Whether the damage was due to vandals, a storm or even an animal, this is an item that needs immediate attention. Not only can people be injured due to the high voltage produced by the system, but the expensive equipment is at risk if intruders enter the area with intent to destroy or steal items. Regular inspection and quick response to this is crucial for all solar farms.

2. Ground Erosion. A naturally occurring process in nature, soil and ground erosion are caused by water and wind. Expected as a gradual occurrence and planned for at a certain periodic rate, sudden erosion can have a deleterious effect on a PV plant. Loss of topsoil can lead to reshaping of the ground and the creation of channels, holes and slopes in earth. This could cause racking to shift affecting the ability of panels to generate the energy. It could also lead to flooding and destruction of equipment. Proper and frequent site monitoring will alert asset managers to anything out of the ordinary happening that could put operations at risk.

3. Transformer Leakage. Routine maintenance that certifies that transformers are in good condition every year helps avoid transformer leakage. A transformer leak can cause land contamination and other safety risks. Knowing if a leak is present and planning for

maintenance to repair or replace it can be key in keeping energy generation at a maximum. There several ways to carry out preventive maintenance in transformers; however, monitoring transformer oil temperature, pressure and level to prevent a transformer from leaking in the first place is the best way to avoid down time issues. To prevent fatal errors, a parameter range is set and automatic alarms can be issued to check on site before the problem scales.

4. Various Inverter Damage. Taking the low voltage, high current signals from PV panels and converting into the voltage compatible with the utility grid, inverters are core components of grid-connected systems. Monitoring of inverters is of high importance, since changes to voltage and frequency may occur that affect performance as well as the safety of those in proximity. Inverter damage may lead to the complete failure of the PV plant or partial string outages as a result of defective inverters. Inverter failures are responsible for roughly 80% of PV system downtime. Clearly a response to any inverter damage must be taken quickly.

5. Broken Conduit. A broken conduit poses danger of shock as well as chaos on the operating system as charges are uncontained. When the construction of a site is finished and the plant goes into operation, earth movements may happen as the ground stabilizes. These movements can cause broken conduit and other issues with cables. Measuring isolation on cables ensures underground runs are damage free. This is important because broken conduit can cause a cable to break or damage the insulation which can cause a fire and personal hazards.

6. Combiner Box Damage. With the ability to simplify wiring, combiner boxes combine inputs from multiple strings of solar panels into one output circuit. Normally 4 to 12 strings are connected to a combiner box. If damaged, they pose a safety risk as well as a major decrease in productivity.

7. Vegetation Overgrowth. Vegetation can transform from a benign nuisance in to a major issue very quickly. In addition to attracting animals that then cause their own brand of destruction, vegetation can shade cells, interfere with wiring and affect structural integrity.

8. Cell Browning/Discoloring. In addition to providing power, UV radiation will lead to aging in panel cells, seen as browning and discoloration. This degradation in the film leads to impaired output and productivity.

9. Panel Shading. When designing a PV plant, it is critical that trees and other obstructions are cleared. PV cell electrical output is very sensitive to shade. If shaded, cells do not add to the power produced by the panel, but they absorb it. A shaded cell has a much greater reverse voltage compared to the forward voltage of an illuminated one, it can absorb the power of many cells in the string and the output will fall drastically. Removal of any trees or structures causing shading will help optimize power output.

10. Shorted Cell. A shorted cell can impact productivity if not addressed in a timely manner. Production defects in semi-conducting material often go undetected before PV cells are put into solar panel assemblies. Identifying these defects through testing via infrared imaging has been used for more than a decade. This efficient, cost-effective test and measurement methods for characterizing a cell's performance and its electronic

structure help ensure maximum energy production.

11. Natural Damage. A hail storm or hurricane can wreak havoc on a solar power plant. Damaged panels, or wind torn racking and other equipment can severely decrease output or completely put a system out of commission. Keeping a pulse on the severe weather and inspecting the equipment following a storm is necessary for the overall health of the solar farm.

12. Vandalism Damage. Vandals pose a major threat to any PV facility. Whether they are stealing or destroying wiring, panels or other equipment, system damage can occur. A solar farm in North Carolina had golf ball damage by a neighbor who decided to use the array as the 18th hole. Detecting this damage through the use of solar monitoring equipment minimized outages and losses.

13. Defective Tracker. An exceptional tool to enhance early morning and late afternoon performance, trackers can increase total power produced by about 20-25% for a single axis tracker and about 30% or more for a dual axis tracker. Defective trackers can contribute significantly to lowered performance output and should be serviced as soon as detected.

14. Racking Erosion. Eroding structures can be a nightmare for a PV facility. Once the structural integrity is degraded, risks to proper water and wind flow within the facility are elevated which can gravely impact the functioning of the facility. As racking moves, panels are moved from their optimal positioning and energy generation suffers.

15. Unclean Panels. Dust, snow, pollen, leaf fragments, and even bird droppings – all can absorb sunlight on the surface of a panel, reducing the light that reaches the cells. Clean surfaces result in increased output performance over the lifespan of the equipment. Routine cleaning should be a part of all O&M plans.

16. Animal Nuisance. No matter whether an animal burrows under a perimeter fence, jumps over it or goes right through it - animals need to be kept out of a solar farm. Once inside the perimeter, they seem to have a way of finding wires to chew and unknowingly destroy equipment.

Having an O&M agreement for a solar farm is a must. Paired with a monitoring system , many of these issues can be prevented and energy production maximized. If you are an asset manager in need of an exceptional O&M company, contact ESA Renewables.

FIT PERMITS ISSUED TO DEVELOPER FOR LOTS IN OCEAN VIEW, HAWAI'I, 96737

TAX KEY	ADDRESS OF PARCELS	**FIT Application Number**	LLC Lessee KONA-	**Date placed in "Active" FIT queue**	Building & Elec Permit Date	Co. Bldg permit number	Co. Elec. permit number	Project Completion Date	**Date lots purchased by developer**	Developer's purchase price in $	**Approx. no of days in Escrow & FIT queue**
3-9-2-						B2012-	E2012-				
190-61	92-978 Maikai Blvd	**50-18**	50-18	**12/30/2011**	2/13/2012	0138K	0154K	9/15/2012	**9/5/2012**	20,000	**250**
191-47	92-918 Maikai Blvd	**50-19**	50-19	**12/9/2011**	2/10/2012	0128K	0146K	9/15/2012	**11/16/2012**	20,000	**343**
187-18	92-804 Kahili Blvd	**50-20**	50-20	**12/9/2011**	2/15/2012	0154K	0184K	9/15/2012	**4/5/2013**	20,000	**483**
188-20	92-8621 Lanikai Dr.	**50-21**	50-21	**12/9/2011**	4/18/2012	0386K	0477K	9/15/2012	**11/9/2012**	18,500	**336**
191-34	92-885 Ali'i Blvd	**50-22**	50-22	**12/9/2011**	2/15/2012	0150K	0182K	9/15/2012	**12/14/2012**	24,900	**371**
186-38	92-1099 Kahili Blvd	**50-23**	50-23	**12/30/2011**	2/15/2012	0152K	0187K	9/15/2012	**4/29/2013**	28,000	**486**
193-49	92-905 Kona Kai Blvd, KK	**50-24**	50-24	**12/30/2011**	2/15/2012	0153K	0183K	9/15/2012	**11/19/2012**	36,500	**325**
192-24	92-733 Ali'i Blvd	**50-25**	50-25	**12/30/2011**	2/13/2012	0137K	0153K	9/15/2012	**1/21/2012**	35,000	**21**
189-96	92-8576 Maile Dr.	**50-26**	50-26	**12/30/2011**	2/13/2012	0136K	0152K	9/15/2012	**4/12/2013**	60,000	**469**
187-34	92-885 Kahili Blvd	**50-27**	50-27	**12/30/2011**	2/15/2012	0149K	0185K	9/15/2012	**2/8/2013**	30,000	**406**
185-84	92-1235 P. Kuhio Blvd	**50-28**	50-28	**12/30/2011**	2/16/2012	0161K	0215K	9/15/2012	**3/14/2013**	60,800	**440**
185-51	92-8647 Maile Dr.	**50-29**	50-29	**12/30/2011**	2/16/2012	0162K	0216K	9/15/2012	**10/11/2012**	30,000	**286**
189-47	92-8540 Maile Dr.	**50-30**	50-30	**12/30/2011**	2/13/2012	0134K	0155K	9/15/2012	**4/10/2013**	35,000	**467**
185-71	92-8688 Macadamia Dr.	**50-31**	50-31	**12/30/2011**	4/18/2012	0388K	0475K	9/15/2012	**9/11/2012**	28,000	**256**
192-12	92-678 Ali'I Blvd.	**50-32**	Terminated	**12/30/2011**	2/13/2012	0135K	0156K		**Sold to G. Hartig-Williams**		
189-60	92-1274 Maikai Blvd	**50-33**	50-33	**12/30/2011**	2/15/2012	0151K	0186K	9/15/2012	**9/6/2012**	135,000	**251**
185-37	92-1251 Kahili Blvd	**50-34**	50-34	**12/30/2011**	4/18/2012	0387K	0476K	9/15/2012	**1/16/2013**	79,000	**383**
190-59	92-998 Maikai Blvd	**50-35**	50-35	**1/26/2012**	2/10/2012	0126K	0149K	9/15/2012	**1/22/2013**	88,888	**362**
190-10	92-1056 Ali'i Blvd	**50-36**	not leased	**Reserve Q**	2/10/2012	0125K	0148K		**3/19/2013**		
191-48	92-8544 Poha Dr.	**50-37**	not leased	**Reserve Q**	2/10/2012	0124K	0147K		**4/9/2013**		
	TOTAL									749,588	

19 of the above lots are controlled by the developer. The remaining lot, no. 15 on this list, was bought by Ms. Gina Hartig-Williams after it had been in escrow for 349 days and developer failed to close the deal. The developer took out PV building and electrical permits, but since the deal was never closed, the developer was never "vested" in this property, nor did the developer have control over the property, as FIT rules require.

										Doolittle's Purch. Price
150-002	Bougainvillaea	**47-8**	Doolittle Tr.	**12/30/2011**	4/11/2012	0471H	NONE	1/13/2013	**5/8/2013**	22,636
150-009	Bougainvillaea	**47-9**	Doolittle Tr.	**12/30/2011**	4/11/2012	0478H	NONE	1/13/2013	**5/8/2013**	22,636
150-003	Macadamia	**47-10**	Doolittle Tr.	**12/30/2011**	4/11/2012	O472H	NONE	1/13/2013	**5/8/2013**	22,636
150-008	Macadamia	**47-11**	Doolittle Tr.	**12/30/2011**	4/11/2012	0477H	NONE	1/13/2013	**5/8/2013**	22,636
150-005	Jacaranda	**47-12**	Doolittle Tr.	**12/30/2011**	4/11/2012	0474H	NONE	1/13/2013	**5/8/2013**	22,636
150-006	Jacaranda	**47-13**	Doolittle Tr.	**12/30/2011**	4/11/2012	0475H	NONE	1/13/2013	**5/8/2013**	22,636
150-004	Macadamia	**47-14**	Doolittle Tr.	**12/30/2011**	4/11/2012	0473H	NONE	1/13/2013	**5/8/2013**	22,636
150-007	Macadamia	**47-15**	Doolittle Tr.	**12/30/2011**	4/11/2012	O476H	NONE	1/13/2013	**5/8/2013**	22,636

These 8 lots are owned by the Doolittle family. No lease in favor of the developer is recorded. These projects were placed in the active queue before the Doolittle Trust bought the land. These are incorrectly listed as being in Captain Cook. The previous owners of record are members of the Klein family. Was a letter of intent issued on 12/30/11? If so, who authored it?

5/22/13

Construction nears for Ka‘u solar farm

By ERIN MILLER

Stephens Media

Construction on a series of solar panels in Ka‘u could begin as soon as 60-90 days, a solar company official said Tuesday.

Neighbors of the project, in the Hawaiian Ocean View Ranchos subdivision, are questioning why the company selected the lots it did and what impact the project could have on their neighborhood.

Pat Shudak, CEO of Solar Hub Utilities, said the company recently completed an interconnectivity study for Hawaiian Electric Light Co. Solar Hub Utilities is contracting with HELCO as part of the feed-in tariff program, which the Public Utilities Commission has already signed off on, setting a payment rate — 23.6 cents per kilowatt hour — for companies to sell renewable energy to HELCO, Hawaiian Electric Co. on Oahu and Maui Electric Co.

Shudak said he doesn’t know exactly when construction of the photovoltaic panels would begin. Construction should take up about 1 acre each on the 3-acre lots purchased through a subsidiary, Ohana Solar Power LLC, last year. Still, Shudak hopes to see work start within two to three months.

Ranchos residents have some questions about the project. One, Ward Lambert, identifies himself as a big solar power proponent.

“I’ve been living on it, using for 20 years,” Lambert said.

But he questioned plans to convert 18 three-acre lots in the development into 250 kilowatt hour photovoltaic farms. Oahu-based Solar Hub Utilities LLC filed last year for building permits to construct the photovoltaic panels.

Lambert said the proposal, which he learned about through a notice in a Ka‘u newsletter, raised a few red flags for him and his Ranchos neighbors.

For one, he wondered why the company wasn’t buying the lots at the bottom of the subdivision. Instead, a number of the lots are at higher elevations, where they have more vegetation, including ohia trees, and less direct sunlight.

“What are they going to do with these lots?” Lambert said. “Are they just going to doze them?”

He also questioned why a solar farm was allowed on the lots, which have an agricultural zoning and land use classification.

That, Planning Director Bobby Jean Leithead Todd said, is something county residents can thank state legislators for. The bulk of the land in the state is classified as agricultural or conservation, she said, with only a small percentage that has been reclassified as urban or residential. On Hawaii Island, 95 percent of the land falls under the ag or conservation designation.

"There's a lot of ag land that is not necessarily the best land for growing crops," Leithead Todd said. "That has to do with soil and water."

The state even acknowledged that not all ag land is good for growing crops, she added. And with a state push toward renewable energy, it was an "important public policy" to open up ag land for creating energy.

At least one of the lots isn't arid lava land, Lambert said. It's next to a lot with a home on it and covered in mature ohia trees. Not only are Ranchos residents worried about the loss of the trees, but they also worry about how the solar farm would protect its solar panels. Lambert speculated the company would surround the lots with chain link fences. Other residents wondered why Solar Hub Utilities hadn't reached out to the community about the project.

Shudak said he will have to protect the panels, but said he has offered to mask the fences with shrubbery or some other kind of foliage. The panels will only be about two-three feet above the ground.

He said he did try to contact a community association in the area, but couldn't get through to anyone. Many of the lot owners the company tried to reach don't even live in the subdivision and were difficult to contact, he said.

While he would have gladly purchased a cluster of lots all in open lava land — particularly flat lava land — Shudak said the company had to go with which lots were for sale.

"The lots we purchased were three times the size we needed," he added. "The terrain is very coarse. Usually you come in and try to levelize it as much as possible."

He said the company will use shade meters to determine which trees will need to be trimmed, cut down or moved.

Solar Hub has been working on the feed-in tariff project with HELCO, HECO and MECO for nearly two years. After reviewing the interconnectivity study, HELCO

determined Solar Hub will need to build a miniature substation to handle the power the company generates in Ka‘u. Shudak said they are still working out the design and engineering for that substation, and that will need to be finished before work on the photovoltaic construction.

“As much of a delay there has been, it’s probably been a benefit,” Shudak said. “The price on solar (equipment) has come down.”

Email Erin Miller at emiller@westhawaiitoday.com.

From: mailinglist@capitol.hawaii.gov
To: PSMTestimony
Cc: valuator1956@yahoo.com
Subject: Submitted testimony for HB2636 on Mar 17, 2016 15:00PM
Date: Thursday, March 17, 2016 5:32:27 AM

HB2636
Submitted on: 3/17/2016
Testimony for PSM/TRE on Mar 17, 2016 15:00PM in Conference Room 229

Submitted By	Organization	Testifier Position	Present at Hearing
Bob Werner	Individual	Support	No

Comments: I respectfully request your support of HB 2636. This bill has been authored in order to address a loophole in existing legislation that allows for large scale commercial solar installations in existing nonconforming subdivisions within the Agricultural District. Currently there is an 8.5 megawatt installation approved and planned utilizing over 20 residential lots in the Hawaiian Ranchos subdivision. It is obvious that an installation of this size and scope is not a compatible use and will have a significant adverse affect on its residents. The original language of this bill has been amended to address the concerns that the bill could limit individual homeowners from installing rooftop solar installations or inadvertently provide a "quasi-authority" for allowing additional non conforming subdivisions in the Agricultural District. There is no remaining legitimate reasons for the opposition of this bill. Thanks you for your consideration. Bob Werner

Please note that testimony submitted less than 24 hours prior to the hearing, improperly identified, or directed to the incorrect office, may not be posted online or distributed to the committee prior to the convening of the public hearing.

Do not reply to this email. This inbox is not monitored. For assistance please email webmaster@capitol.hawaii.gov

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March 16, 2016

TESTIMONY IN OPPOSITION TO HB2636HD2

The Senate should reject HB2636HD2, which would hurt Hawai'i's efforts toward energy self-sufficiency. The State and its Legislature have made many noble pronouncements and set noble goals about switching to solar and other forms of renewable energy, such as the goal of "100%" of our electricity coming from renewable sources by 2045. So why pass an anti-solar energy bill?

Global warming is the world's most serious environmental problem, and we have to do our part to cut down our use of fossil fuels. All renewable energy sources can have some negative effects, but solar PV is probably the most benign. A PV array doesn't make noise, cause smells, or emit pollutants. Its visual impact is much less, and confined to a smaller radius, than wind turbines. It just sits there pumping out electricity.

HB2636HD2 is probably inspired by the opposition to a project planned for the Hawaiian Ranchos area in Ka'u which would consist of solar PV arrays covering about 26 scattered 2 acre lots, and generating about 250 kilowatts per lot. Perhaps a neighbor of a project like this might rather see a vacant lot next door rather than a solar array protected by a fence. It is not visually appealing. But it is not significantly less attractive than many other uses that can be made of that same lot in the ag district. For example, the lot could be covered in shade cloth structures. And why would the Legislature, in balancing the various interests involved, change the laws allowing a solar development like this, which would, on each lot, generate enough electricity for 50-100 homes? Surely the public benefit greatly outweighs the perceived harm. We will never make significant progress in producing renewable energy if the Legislature succumbs to NIMBY-ism.

Sometimes people focus so much on potential negatives that we ignore the positives. For this project, it is reasonable to estimate that it will prevent about 8,000 tons per year of carbon dioxide from going into the atmosphere compared to power generated by fossil fuels.

A special permit can be a major hurdle for a project like this. It can trigger a contested case hearing, which can take years to resolve in the courts. In the meantime, even if the permit gets approved by the County Planning Commission, the solar developer takes a risk if it starts construction while an appeal is pending. The permit could be reversed on procedural grounds that have nothing to do with the merits.

I'm writing as an individual and not in any official capacity, but I was planning director of Hawai'i County for eight years and I'm very familiar with the special permit process and the problems that can arise.

The bill, as currently written, would apply in Hawai'i County, and, within a few years, Maui County too. While it may have one target, it will affect many other properties—probably most lots in the agricultural district in these counties.

The definition of the subdivisions affected is extremely vague. It would make whether solar PV is allowed without a special permit depend upon the "promotional plan" of the original developer. A lot owner, who may have bought the property fifty or a hundred years after the original subdivision, has no reason to research what the "promotional plan" of the original developer was. To bind lot owners any such promotional plan should have been put into private covenants. This would be the first time that Hawai'i's land use laws would make a private developer's "promotional plan" relevant to the uses allowed by zoning.

The bill has a number of other technical flaws, most of which I won't discuss because it should simply be rejected. One deserves special mention, though: while I don't have enough information to make a complete judgment on this, it's likely that the Ka'u project has "vested rights" and cannot be affected by this bill. So intended target may escape while the Legislature makes other solar energy projects more difficult.

I don't have any personal involvement in this Ka'u project, and I hope the developers, like anybody, try to be good neighbors and listen to the reasonable concerns of their community. But the Legislature should not put obstacles in the way of PV projects like this and others that can help reduce global warming.