LINDA LINGLE
GOVERNOR

JAMES R. AIONA, JR.
LT. GOVERNOR

KURT KAWAFUCHI
DIRECTOR OF TAXATION

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DEPUTY DIRECTOR

STATE OF HAWAII
**DEPARTMENT OF TAXATION**
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**HOUSE COMMITTEE ON FINANCE**
**TESTIMONY REGARDING HB 1464 HD 2**
**RELATING TO ENERGY RESOURCES**

**TESTIFIER: KURT KAWAFUCHI, DIRECTOR OF TAXATION (OR DESIGNEE)**
**DATE: FEBRUARY 27, 2009**
**TIME: 1PM**
**ROOM: 308**

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This clarifies application of the required solar-thermal energy system law.

The House Committee on Energy & Environmental Protection made technical amendments to this measure.

The House Committee on Consumer Protection & Commerce amended provisions relating to the counties' control to modify the solar water heater requirements.

The Department of Taxation **prefers the Administration measure HB 1053**, which better accomplishes the renewable energy policy needed to reduce the State's dependence on oil.

**SUPPORT FOR ALTERNATIVE ENERGY**—The Department strongly supports the encouragement and implementation of alternative energy systems in Hawaii in order to lessen the State's dependence on alternative energy. As fossil fuel and petroleum prices become more volatile, Hawaii's ability to generate its own energy from home will make the State more secure and less reliant on others. The Department concurs that photovoltaic and other sun-related energy generation is particularly beneficial given Hawaii's relative location to the sun.

**BUILDING PERMIT LANGUAGE WAS UNCLEAR**—The Department prefers the language in HB 1053. The Department understands the intent that only "new construction" homes are to be disqualified. However, the law is not that clear. A building permit is necessary for any addition or amendment to a home, as well as installation of the energy system. The issue then, is that the term "building permit" could be interpreted to be any permit, which could disqualify a taxpayer. However, by eliminating the permit language, as this bill does, any single-family home may qualify for the solar thermal credit even newly-constructed homes where the solar water heater is mandated by HRS § 196-6.5.

This bill has a positive impact of about $0.2 million.

LINDA LINGLE
GOVERNOR
THEODORE E. LIU
DIRECTOR
MARK K. ANDERSON
DEPUTY DIRECTOR

# DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

No. 1 Capitol District Building, 250 South Hotel Street, 5th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804
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Statement of
**THEODORE E. LIU**
**Director**
Department of Business, Economic Development, and Tourism
before the

**HOUSE COMMITTEE ON FINANCE**
Friday, February 27, 2009
1:00 p.m.
State Capitol, Conference Room 308

in consideration of
**HB1464,HD2**
**RELATING TO ENERGY RESOURCES.**

Chair Oshiro, Vice Chair Lee, and Members of the Committees.

The Department of Business, Economic Development, and Tourism (DBEDT) does not support HB1464,HD2, which directs the Energy Resources Coordinator to accept solar hot water variance requests and outlines procedures for variances. HB1464,HD2, also reduces tax credit amounts to be claimed under certain circumstances.

Since the Public Benefits Fee Administrator is statutorily charged with implementing energy efficiency programs, including solar water heating incentive programs and program criteria, we strongly recommend that the Public Benefits Fee Administrator also administrates variances for these programs.

We defer to the Department of Taxation on tax matters.

Thank you for the opportunity to offer these comments.

L E G I S L A T I V E

# TAXBILLSERVICE

126 Queen Street, Suite 304 TAX FOUNDATION OF HAWAII Honolulu, Hawaii 96813 Tel. 536-4587

SUBJECT: INCOME, Renewable energy resources

BILL NUMBER: HB 1464, HD-2

INTRODUCED BY: House Committee on Consumer Protection and Commerce

BRIEF SUMMARY: Amends HRS section 235-12.5(a)(2)(A) relating to wind energy systems to add the phrase "unless all or a portion of the system is used to fulfill the substitute renewable energy requirement pursuant to HRS section 196-6.5(a)(3), then the credit shall be reduced by 20% of the actual system cost or $1,500, whichever is less."

Also amends HRS section 235-12.5(a)(3)(A) relating to photovoltaic energy systems to add the phrase "unless all or a portion of the system is used to fulfill the substitute renewable energy requirement pursuant to HRS section 196-6.5(a)(3), then the credit shall be reduced by 35% of the actual system cost or $2,250, whichever is less."

Makes other nontax amendments to HRS sections 196-6.5 and 269-44.

EFFECTIVE DATE: Tax years beginning after December 31, 2008

STAFF COMMENTS: Last year the legislature by Act 204, SLH 2008: (1) provided that after 1/1/10 no building permit shall be issued for a single-family dwelling that does not include a solar water heater system; (2) provided that the income tax credit for solar thermal energy systems shall only be available to single-family residential properties for which a building permit was issued prior to 1/1/10; and (3) provided that the renewable energy technologies tax credit may not be claimed by residential home developers for systems placed in service in 2009. While Act 204 added language to HRS section 196-6.5(a)(3) referring to a renewable energy technology system as defined in HRS section 235-12.5, that is substituted for use as the primary energy source for heating water, it is questionable what is the substitute energy technology system other than a solar thermal energy system that is available to heat water, as there is no such definition in HRS section 235-12.5. Absent such a definition, it is unclear how the credit amount is to be calculated if this measure is enacted.

Digested 2/26/09

**TESTIMONY OF CARLITO P. CALIBOSO**
**CHAIRMAN, PUBLIC UTILITIES COMMISSION**
**DEPARTMENT OF BUDGET AND FINANCE**
**STATE OF HAWAII**
**TO THE**
**HOUSE COMMITTEE ON FINANCE**

**FEBRUARY 27, 2009**

**MEASURE:** **H.B. No. 1464 H.D.2**
**TITLE:** **Relating to Energy Resources.**

Chair Oshiro and Members of the Committee:

**DESCRIPTION:**

This bill proposes to clarify provisions of Act 204, Session Laws of Hawaii ("SLH"), 2008, and section 196-6.5, Hawaii Revised Statutes ("HRS"), with respect to variances for solar water heater systems made available pursuant to solar water heater system standards authorized and developed by the public utilities commission ("Commission") under section 269-44, HRS. The bill also amends section 269-44, by removing the date certain by which the Commission standards are to be established and allows the Commission to contract with the public benefits fee ("PBF") administrator for the development of those system standards. In addition, this bill amends section 235-12.5, HRS, relating to tax credits available for solar thermal energy systems.

**POSITION:**

The Commission has no objection to section 4 of this bill as it proposes to amend section 269-44, HRS, relating to the Commission being authorized to contract with the PBF administrator to develop standards for solar water heater systems. The Commission has no comments regarding the remaining sections and elements of this bill.

Thank you for the opportunity to testify.

THE GAS COMPANY

Testimony in Support of HB 1464 HD2, Relating to Energy Resources

P.O. Box 3000
Honolulu, Hawaii 96802-3000

February 26, 2009

Aloha Chair Oshiro, Vice Chair Lee and Members of the Finance Committee:

My name is Jeffrey Kissel, President and CEO of The Gas Company. Thank you for the opportunity to provide testimony on HB1464, HD2, related to Energy Resources.

The Gas Company strongly supports HB1464, HD2 which clarifies provisions of Act 204 related to solar water heaters because it proposes to promote more consumer options for energy efficiency in any new construction beginning January 2010.

HB1464, HD2 promotes energy efficient choices by allowing among other choices, an energy efficient instantaneous gas water heating system as a variance when solar water heating systems cannot be the only energy technology in a new home. Act 204 (2008) not only requires solar water heating but rightfully recognizes that energy efficient instantaneous gas water heating systems can and should be allowed. HB1464 HD2 recognizes that on-demand gas water heaters are an energy efficient alternative that homeowners should be given the opportunity to select.

Solar is only as good as the sunshine that shines on your roof or immediately outside your home during the daytime, and therefore, solar needs a back-up, at present, most solar water heaters are backed up with electric tank-type storage units. Gas is the best partner to solar for several reasons:

- It is three times more efficient than electricity at delivering heat energy to the home for heating water, cooking food and other domestic uses;
- It is available day and night and even on cloudy and rainy days;

The gas we sell is made from byproducts of oil. It doesn't require us to import one drop of additional oil. Furthermore, the gas we manufacture for the island of Oahu already has a 4-to-6 percent renewable energy component of pure hydrogen with a zero carbon footprint. We are actively taking the necessary steps to increase the renewable content of our gas to 50 percent for the entire state within five years.

Our strategy includes diversifying our feed stock to include gas from renewable resources such as landfill gas and bio-methane, and other renewable sources, including animal fat and plant oils that are locally produced.

It is important to point out that all of these activities are being solely financed by our Company, without government subsidy or an added burden on our rate payers. This confirms our Company's commitment toward investing in Hawaii's energy future. In fact, we believe that we can successfully replace at least half of our feedstock supply with renewable sources and actually lower our cost of production from present levels.

I would like to call upon my colleagues in the energy business to focus on the greater objectives - those of reducing our dependence on fossil fuel in every possible way - and urge them to join us in collaboration rather than seek to advance one position over another or one technology in favor of another. Gas is not a complete solution to imported oil, but it is an immediate bridge fuel that can be used to reduce our dependence on oil TODAY. By including gas as part of the solution, it buys the State time to develop other renewable technologies that will ultimately replace fossil fuels. In addition allowing gas as a back-up energy source enables us to conserve the electricity we have.

We believe that there is a greater need to move collectively in the right direction especially since no alternative, including solar, has a zero carbon footprint. Thus, we should consider all energy efficiency options in moving Hawaii forward in leading the nation in renewable and sustainable energy solutions in the 21st century.

ACT 204 (2008), as passed last year with the inclusion of energy efficient water heating devices, had broad base support. The final version of the bill addressed global warming, (2) promoted renewable energy, (3) established energy conservation and efficiency in all new residential construction, and (4) recognized that homeowners and builders should have access to a variety of energy saving alternatives. This landmark legislation represents a significant and positive step towards achieving the Legislature's vision of promoting energy security and reducing Hawaii's dependence on petroleum.

We believe Act 204 should be given a chance to work. There are adequate safeguards built into the legislation. With the inclusion of gas in Act 204, the legislature recognized that homeowners and builders should have access to a variety of energy conserving alternatives. We have attached data to our testimony to support these statements.

The Gas Company is proud of its reputation of providing our island residents and businesses with dependable gas energy. Gas has one-third the carbon footprint as electricity and is available day and night. When teamed with solar, it can reduce cost and carbon consumption by more than 80 percent.

Moreover the gas network of pipelines is the only alternative to delivering renewable energy to Hawaii's homes and businesses other than our already stressed electric grid. Our network of pipelines can be expanded at a much lower cost than constructing undersea cables and other grid stabilizing devices. Since 40% of the energy consumed in our homes is for heating water, cooking foods, and drying clothing it makes good sense to deliver it with gas pipelines and solar devices rather than first converting it to electricity and loosing nearly 2/3 of the energy value in the process.

For this reason alone it is important to preserve the integrity of Hawaii's gas resources as ACT204 rightfully does.

Even after hurricanes, electricity blackouts, and the attack on Pearl Harbor, our customers could always depend on our reliable delivery of gas. It is because of our solid reputation of serving Hawaii as a dean, efficient and reliable energy provider that we believe The Gas Company must continue to have an integral role in Hawaii's sustainable solutions.

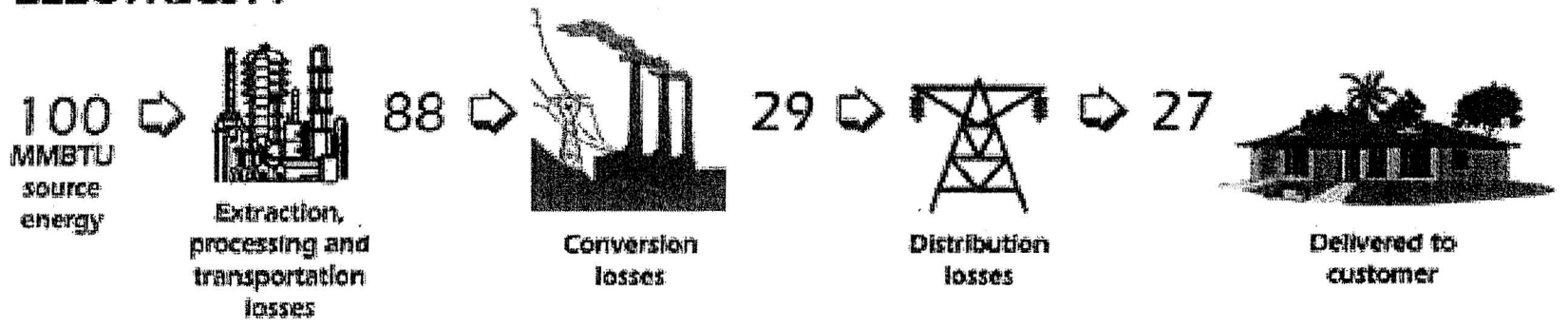
We encourage you to pass this bill to allow consumer choice options by including gas as a variance for energy efficiency as provided in Act 204 (2008).

Thank you for allowing The Gas Company to present these comments.

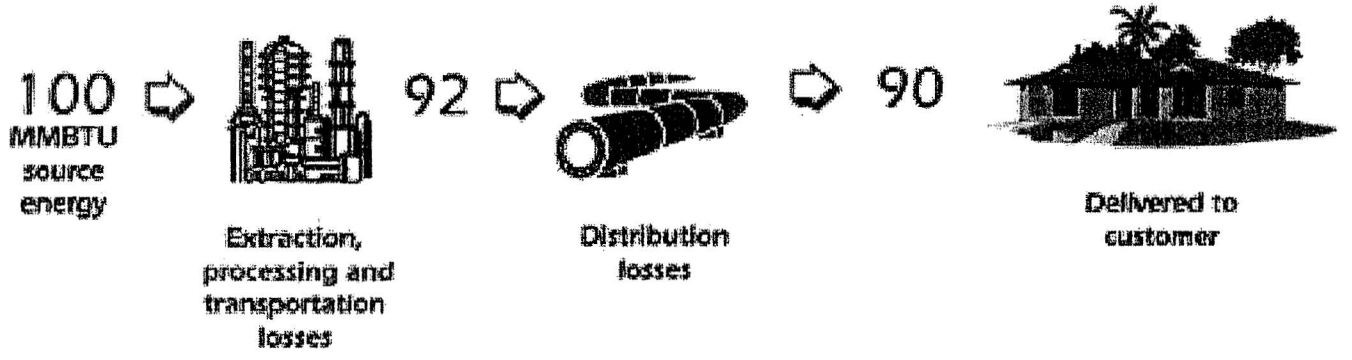
# Site vs. Source Efficiency

The truth about efficiency — and what the labels don't tell you.

## ELECTRICITY




## SYNTHETIC NATURAL GAS




*Thanks to lower conversion losses, three times more energy reaches the customer with synthetic natural gas than with electricity.*

# Heating Up: the Debate about Instantaneous Water Heaters

What is an instantaneous water heater? Sometimes called tankless or demand water heaters, instantaneous water heaters (IWHs) don't have storage tanks, and therefore don't have the standby losses of tank-type conventional water heaters (CWHs). Consequently, they must have enough heating capacity to instantly heat water flowing through at various flow rates and temperatures. More sophisticated models modulate electric or gas input to handle widely fluctuating input water temperatures from solar systems.

Are IWHs significantly more efficient than conventional water heaters? IWHs, by avoiding standby losses (heat losses to ambient air from storing hot water), are more efficient than conventional water heaters. The question is how much more efficient. Standby losses depend on water heater design, size of the tank, ambient temperature, set point temperature, and hot water draw rate.

To reduce exaggerated claims, GAMA (Gas Appliance Manufacturers Association) rates residential gas water heaters under a standard test procedure. Based on the results of the testing, each model is assigned an Energy Factor (EF) value. The EF represents the fraction of hot water energy delivered (41,045 BTUs) divided by the total energy consumed, including combustion and standby losses. GAMA then calculates the annual water heating cost (at their assumed gas rate) for a typical family using 64.3 gallons a day of 1 40°F hot water, and publishes the Energy Factor and energy cost information both on their website, www.gamanet.org, and on the yellow "Energy Guide" tags on new residential water heaters. Energy Factors for tank-type water heaters range from .55 to .67, while EFs for instantaneous heaters range from .80 to .92, with the vast majority hanging in the low 80's.

To give a numerical example, let's assume you're comparing energy costs of a conventional water heater model with an Energy Factor of .60 with an IWH which has an EF of .80. Immediately we know the savings will be (.80-.60)/.60, or 33%. In dollars per year at an SDG&E gas rate of $1.20 per therm, this is (41,045/100,000)/.06 x .33 x $1.20 x 365days = $100 per year. Keep in mind that this example is comparing new water heaters, using the GAMA 64.3 GPD (41,045 BTUs a day) profile. If your actual daily draw is much higher or lower than 64.3 GPD, the resulting savings will be somewhat proportional. The savings with higher consumption are not strictly proportional (but close) because higher cold water daily flows through a tank-type heater tend to lower the average tank temperature while it recovers. Therefore the standby losses go down and the Energy Factor goes up.

A large US manufacturer, Bradford White, which makes both tank-type water heaters and tankless water heaters, tested two conventional water heaters versus two instantaneous water heaters. They published the results in PM Engineer Magazine, January 7, 2005. The results showed some interesting conclusions:

- first, tank-type water heaters are becoming more efficient so the savings of tankless models is less,
- second, the constant-burning pilot light on one tankless model nearly wiped out the savings in standby losses,
- third, higher draw rates (107 GPD vs. the GAMA 64 GPD) seemed to raise the Energy Factors of the tank-type water heaters,
- finally (San Diegans take note!) water hardness was more detrimental to tankless water heaters than to tank-type water heaters. The tankless water heaters lost nearly

2% efficiency in only two weeks! This may be explained by higher intensity combustion in the tankless unit, impacting slow-flowing hard water in a constricted passageway. Bradford White recommends periodic de-liming service or water softening in hard water areas.

Is it good to combine IWHs with solar water heating? It's good if your goal is to squeeze out every last bit of savings, such as for a Zero Net Energy home or to fight global warming. But the economic advantages are marginal. The solar system should be sized to save about 70% of water heating energy, which leaves only 30% for the IWH to work on. Given the GAMA example above, with $1.20 per therm, the IWH savings would be reduced from $100 per year to 0.33 x $100 = $33 a year. Given that installed costs for IWHs can be twice those for conventional water heaters ($1600 vs. $850), the payback for the additional investment of $750 would be $750/$33 = 23 years. If you're a serious global warming battler, go for it! .

The following chart compares total undiscounted 20-year lifecycle costs for various types of water heaters. It reflects San Diego area gas & electric energy costs, and assumes no inflation of these costs. Note that solar does very well in this comparison because it is highly incentivized through 2008. Also note that if rates rise and if longer periods are evaluated (solar collectors should last 30 years), the comparative benefit of solar is even greater.

**Comparing Life Cycle Costs**

| Water Heater Type | Energy Factor (EF) | Cost | Yearly Energy Cost | Life (Years) | 20 Year Total Cost |
|---|---|---|---|---|---|
| Conventional Gas Tank-type heater | 0.6 | $850 | $300 | 13 | $7,700 |
| Electric Tank-type heater | 0.9 | $750 | $634 | 13 | $14,180 |
| Gas Demand heater (no pilot) | 0.8 | $1,600 | $225 | 20 | $6,100 |
| Solar with electric heater (1-tank) | 3 | $2,660 | $190 | 20 | $6,460 |
| Solar with gas heater (2-tank) | 2 | $3,360 | $90 | 20 | $5,160 |

Notes.

1. Costs are installed costs. Solar gross costs: 2-tank gas backup = $6,000 Solar 1-tank electric backup = $5,000
2. Based on 64.3 gallons a day (family of four, 41,045 Btus a day)
3. $1.20 a therm for gas. $.13 a kWh for electric
4. **No fuel price escalation**
5. Solar based on 70% Solar Fraction
6. Solar cost reduced by 30% Federal Tax Credit and CCSE rebate of about $1 ,200*
7. The average electricity cost for large homes can reach$0.20/kWh or more

*** SWH rebates and Federal Tax Credits expire Dec. 31, 2008**

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**Resources**


1. www.aceee.org/consumerguide/waterheating.htm
2. www.gamanet.org
3. www.eere.energy.gov/consumer

**Testimony Before the House Committee**
**On**
**Finance**

**February 27, 2009 (1:00 PM; Agenda #4)**

**H.B. 1464 H.D. 2 RELATING TO ENERGY RESOURCES**

**By: Joanne Ide**
**Energy Services Department**
**Hawaiian Electric Company, Inc.**

Chair Oshiro, Vice Chair Lee and Members of the Committee:

My name is Joanne Ide, and I represent Hawaiian Electric Company (HECO) and its subsidiary utilities, Hawaii Electric Light Company (HELCO) and Maui Electric Company (MECO). I appreciate the opportunity to present testimony on H.B. 1464 H.D. 2.

HECO supports the intent of this bill to clarify provisions of Act 204, with respect to the availability of tax credits for retrofit installations of solar water heater systems and the effort to strengthen solar water heating system quality assurance through the development of system standards.

However, if a gas tankless instantaneous water heater or any other energy efficient water heating technology is considered under a variance, it should be done only in the event the first and second variances are met; that is, the installation of a solar water heater is impracticable due to poor solar resource, or it is cost-prohibitive based upon a life cycle cost-benefit analysis for the new single-family dwelling. Furthermore, in recognition that the purpose of Act 204 is to increase the use of renewable energy to protect our environment, gas should only be allowed if the renewable content of the gas used is equal to or greater than the electric utilities' Renewable Portfolio Standard.

We have attached proposed language to reflect our suggestions as noted above. We believe that with these amendments, the law enacted by Act 204 will truly reflect the Legislature's intent of weaning our state off our dependency on fossil fuel.

Thank you for the opportunity to testify on this measure.

Suggested amendments to HB 1464, HD 2

Changes are noted in **BOLD:**

SECTION 2. Section 196-6.5, Hawaii Revised Statutes, is amended by amending subsections (a) and (b) to read as follows:

"(a) On or after January 1, 2010, no building permit shall be issued for a new single-family dwelling that does not include a solar water heater system that meets the standards established pursuant to section 269-44, unless the energy resources coordinator [~~approves~~] accepts a variance. A variance application shall only be [~~approved~~] accepted if submitted by an architect or mechanical engineer licensed under chapter 464, who attest that:

(1) Installation is impracticable due to poor solar resource;

(2) Installation is cost-prohibitive based upon a life cycle costs-benefit analysis that incorporates the average residential utility bill and the cost of the new solar water heater system with a life cycle that does not exceed fifteen years;

(3) A [~~substitute~~] renewable energy technology system, as defined in section 235-12.5, is [~~used~~] substituted for use as the primary energy source for heating water; or

(4) A demand water heater device approved by Underwriters Laboratories, Inc., is installed; provided that at least one other gas appliance is installed in the dwelling **and the first or second variances in Section 2 subsection (a) (1) and (a) (2) are met.** For purposes of this paragraph, "demand water heater" means a gas-tankless instantaneous water heater that provides hot water only as it is needed. **Furthermore, a demand water heater device should only be substituted for use as the primary energy source for heating water if the renewable content of the gas used is equal to or greater than the electric utilities' Renewable Portfolio Standard.**

blue planet FOUNDATION

**HOUSE COMMITTEE ON FINANCE**
February 27, 2009, 1:00 P.M.
Room 308

**(Testimony is 3 pages long)**

**TESTIMONY IN SUPPORT OF HB 1464 HD2 WITH AMENDMENTS**

Chair Oshiro and members of the committee:

The Blue Planet Foundation supports House Bill 1464 HD2, making clarifying amendments and improvements to Hawaii's historic Solar Roofs Act. **We urge the Finance Committee, however, to make at least one critical amendment to this measure: removing the "gas" variance option.**

The 2008 Solar Roofs Act, Act 204, was a critical step forward toward Hawaii's clean energy future as it ensures that nearly every new home will be equipped with a solar water heater. While we strongly support the existing law, we believe that it could be improved. Specifically, Blue Planet supports the following changes to the existing solar requirement:

1. **Blue Planet supports charging the new public benefits fund administrator with the duty to accept and issue variances** instead of the energy resources coordinator at the Department of Business, Economic Development, and Tourism. We understand that there is some discussion about the legality of tasking a private entity with this somewhat regulatory responsibility, but if it is allowed, aligning the existing demand side management entity with this duty makes sense. The public benefits fund administrator should have an up-to-date understanding of the solar technology and the basis for granting or denying waivers.

2. **Blue Planet strongly supports removing the on-demand gas heater variance option.** Such an option should only be allowed (and perhaps required) if the first and second variances are met—that is, the home has poor solar resource and solar would fail the cost-effectiveness test. The variances should only be exercised in rare circumstances where solar doesn't make sense or is not cost effective. We fear that the current language in the law may provide a loophole and create new all-gas subdivisions (particularly if the Gas Company provides free or greatly reduced cost appliances to new developers to encourage gas use).

3. **Blue Planet strongly supports clarifying that the solar tax credits for homes built prior to January 1, 2010, remain in place.** We believe this was the clear intent of the

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55 Merchant Street 17th Floor • Honolulu, Hawai'i 96813 • 808-954-6142 • blueplanetfoundation.org

original Act, but making this policy abundantly clear is critical to provide comfort and certainty in the industry.

4. **Blue Planet supports using a portion of the demand side management surcharge for establishing and maintaining a post-installation inspection process.** Such an inspection would verify that the solar water heater was installed in accordance with the quality and performance standards established in §269-44.

Our testimony in support of the Solar Roofs Act in general follows.

The 2008 Solar Roofs Law will provide far-reaching environmental and economic benefits for Hawai'i and is the type of transformative policy that will help define our clean energy future. Based on current solar adoption rates, this new policy will reduce the need for thousands of barrels of oil annually and reduce greenhouse gas emissions by thousands of tons from the residential sector. For the first time, the Act established in law the creation of quality and performance standards for new solar water heaters. Starting in 2010, with solar water heaters a standard feature on new homes, residents will be more accustomed to the benefits of solar, turning more of them into potential customers for photovoltaic and other renewable energy devices.

Last year's historic Solar Roofs Act has broad support. People get it. It rings true. Houses should be built with solar up front. To spend more to retrofit a home later just doesn't make as much sense. Last year's bill passed with the support of numerous organizations (including the AIA), many individuals, and the editorial boards of both Honolulu dailies. The law also put Hawai'i on the map as a national leader in clean energy. Being the first state in the nation with such a progressive energy requirement launched Hawaii into the pages of the *New York Times* and *USA Today* and onto MSNBC and CNN.

Solar water heating is a foundation block in building Hawaii's clean energy future. A solar water system is the most basic renewable energy device to harness the clean energy from the sun. The technology is mature, tested, and works (the Romans, in fact, used solar energy to heat the water flowing to baths in aqueducts). Solar water heaters provide the greatest energy savings per dollar for reducing substantial residential energy demand. The Solar Roofs Act ensures that the vast majority of new homes come equipped with this clean energy device, and helps to smooth the transition toward zero-energy homes of the future.

With 60,000 new homes planned for O'ahu alone over the next 20 years, the Solar Roofs Act is critically needed to ensure that we build them energy-smart and minimize the need for additional electricity demand. The first step toward zero-energy homes is the use of solar water heaters (the next step is to reduce electricity demand with efficient appliances and lighting, and the final step is to meet the remaining electricity demand with solar photovoltaic or other clean energy device). New homes, of course, are only part of the picture—hundreds of thousands of existing housing units in Hawai'i need to be retrofit with solar water heaters as well.

While Hawai'i leads the nation in the percentage of installed residential solar water heaters, some 75% of homes still lack this basic amenity. That means hundreds of thousands of housing units in Hawai'i rely on fossil fuel to keep their showers hot. Some local builders are starting to offer solar water heating as an option for new home buyers, but the majority of new homes built in Hawai'i do not use solar. Even with the established solar industry in Hawai`i and ample incentives, the most new homes are not converting to solar. Considering that we are adding around 5,000 new homes in Hawai'i annually, the Solar Roofs Act will go a long way to reduce fossil fuel use and greenhouse gas emissions.

Solar water heating is the single best "clean" energy alternative for residences in Hawai'i. A typical family home with solar water heating avoids over 2.5 tons of carbon dioxide from being emitted annually (about 3000 kilowatt-hours avoided). If approximately 5000 new homes are built annually and only 25% eventually have water heaters installed, the Solar Roofs Act prevent nearly 10,000 tons of greenhouse gases additionally from being emitted every year and over 3 million tons after 25 years. What's more, the energy from the sun is stored in the form of hot water, offsetting the electrical system peak that occurs in the evening. This helps offset the need for expensive new power plants—another societal benefit from increased residential solar energy use.

The Solar Roofs Act will greatly increase the efficiency and affordability of new homes built in Hawai'i. Solar water heaters are among the most effective means of reducing the high electricity cost burden that residents now endure. The solar roofs bill makes the cost of living more affordable by slashing the electric utility bill of an average new home by 30 to 40 percent—saving over $1000 annually for an average household on Kaua'i.

With average household use, most solar water heaters will pay for themselves in energy savings between 3 and 7 years. When systems are built into a home during construction—and when many systems are installed simultaneously in a larger subdivision and economies of scale are realized—solar water heaters are less expensive than an electric heater retrofit. When rolled into a 30-year mortgage, homeowners with solar will start saving money on day one. Even with other financing schemes, solar is a no-brainer investment that brings down the monthly cost of living. If current trends continue, the cost of residential electricity will continue to grow, making electric water heating even more expensive—and solar water heating more of a "no-brainer."

The cost of living is a top-of-mind issue for many in Hawai'i. The Solar Roofs Act makes new home ownership more affordable by reducing the monthly utility burden.

Thank you for the opportunity to testify.