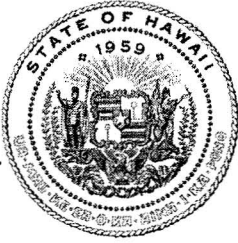


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**DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM**

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Statement of
THEODORE E. LIU
Director
Department of Business, Economic Development, and Tourism
before the
**HOUSE COMMITTEES ON
ENERGY & ENVIRONMENTAL PROTECTION
AND
HOUSING**
Thursday, February 5, 2009
10:00 a.m.
State Capitol, Conference Room 325

in consideration of

**HB1464
RELATING TO ENERGY RESOURCES.**

Chair Gabbard, Chair Cabanilla, Vice Chair English, Vice Chair Chong, and
Members of the Committees.

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

We, support SB871, an Administration measure, which directs the Public Benefits Fee
Administrator with implementing energy efficiency programs, including solar water heating
incentive programs and variances for these programs.

We defer to the Department of Taxation on tax matters.

Thank you for the opportunity to offer these comments.

A 15:24 2/4

LINDA LINGLE
GOVERNOR

JAMES R. AIONA, JR.
LT. GOVERNOR



KURT KAWAFUCHI
DIRECTOR OF TAXATION

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**HOUSE COMMITTEE ON ENERGY & ENVIRONMENTAL PROTECTION
TESTIMONY REGARDING HB 1464
RELATING TO ENERGY RESOURCES**

TESTIFIER: KURT KAWAFUCHI, DIRECTOR OF TAXATION (OR DESIGNEE)

DATE: FEBRUARY 3, 2009

TIME: 9AM

ROOM: 325

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

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.

TAXBILLSERVICE

126 Queen Street, Suite 304

TAX FOUNDATION OF HAWAII

Honolulu, Hawaii 96813 Tel. 536-4587

SUBJECT: INCOME, Renewable energy resources

BILL NUMBER: SB 1198; HB 1464 (Identical)

INTRODUCED BY: SB by English, Espero, Tsutsui and 8 Democrats; HB by Morita, Awana, Belatti, Cabanilla, Chang, Evans, C. Lee, Manahan, Marumoto, Mizuno, Nishimoto, B. Oshiro, Pine, Say, Shimabukuro, Thielen and 4 Democrats

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 “substitute energy technology system, as defined in HRS section 235-12.5” it is questionable what constitutes a substitute energy technology system 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 2/4/09



February 5, 2009

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

Testimony for HB 1464 Relating to Energy Resources

Aloha Chair Morita, Vice-Chair Coffman and Members of the Committee.

My name is Jeffrey Kissel, President and CEO of The Gas Company. Thank you for the opportunity to provide testimony on HB 1464, relating to energy resources.

The Gas Company strongly supports HB 1464 which clarifies solar water heater variance request procedures and provides guidance with respect to solar water heater system standards.

The Gas Company applauds the passage of Act 204 (2008), which was a tremendous step in helping our Hawaii residents increase their household energy efficiency. HB 1464 maintains the integrity of Act 204 (2008) and its promotion of energy efficiency in Hawaii by requiring that solar water heating or on-demand gas water heaters be installed in the construction of all new single family residences, unless installation is impracticable due to poor solar resource, cost-prohibitive, or can be substituted with a renewable energy device.

HB 1464 maintains consumer choice among high efficient, reliable water heating technologies and recognizes that on-demand gas water heaters are an energy efficient alternative for residential homeowners to consider when they decide how best to heat their water.

A gas assisted solar water heating device uses only one-eighth as much oil to heat a gallon of water then electric water heating appliances. For other uses, gas has no more than one-third the carbon footprint than comparable electric appliances. We have attached additional data to our testimony to support these statements.

We believe that on-demand gas water heaters are an energy efficient means of heating water when compared to other alternatives and should, along with solar water heating systems, remain an option for Hawaii consumers.

The Gas Company continues to support the State's efforts in encouraging energy efficiency and diversifying our alternative energy sources. As a utility, we are proud of our continuing ability to provide safe and reliable energy to the people of Hawaii.

We encourage you to support this bill and retain consumer choice options for energy efficiency provided in Act 204 (2008).

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

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 140°F hot water, and publishes the Energy Factor and energy cost information both on their website, www.gama.net/orcl, 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 \times .33 \times \$1.20 \times 365\text{days} = \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 \times \$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)	Yearly 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)		\$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/kVWh or more

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

Resources

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



**HOUSE COMMITTEE ON ENERGY & ENVIRONMENTAL PROTECTION
HOUSE COMMITTEE ON HOUSING**

February 5th, 2008, 10:00 A.M.
Room 325

(Testimony is 3 pages long)

TESTIMONY IN SUPPORT OF HB 1464 WITH AMENDMENTS

Chairs Morita and Cabanilla and members of the committees:

The Blue Planet Foundation supports House Bill 1464, making clarifying amendments and improvements to Hawaii's historic Solar Roofs Act. We would also support additional amendments in this measure.

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.
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 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.

Blue Planet has no strong opinions regarding the other amendments suggested in this measure.

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.