SB 390

INTER-ISLAND SOLAR SUPPLY

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March 2, 2009
Written Testimony Before the Senate Committee on Ways and Means
Senate Bill 390 SD1 Relating to Energy Resources

Chair Kim, Vice Chair Tsutsui, Members of the Committee,

My name is Ron Richmond and I represent Inter-Island Solar Supply (IISS), a local wholesale/distributor of solar energy and energy efficiency products, including gas water heaters for over 35 years in Hawaii.

Senate Bill 390 SD1 improves upon Act 204 passed last legislative session. Act 204 attempted to mandate solar water heating systems for all newly constructed single-family dwellings beginning 2010. IISS strongly believes that the best course of action this legislature could take this session is to **repeal Act 204**. Given that unlikely outcome, IISS believes that SB 390 SD1 corrects some of Act 204's deficiencies and therefore, supports this bill.

Upon careful review of SB 390 SD1, IISS has identified the following areas where the state's objectives of reducing dependence on imported fossil fuels and increasing use of solar and other renewable energy technologies can be enhanced by amending this bill as follows:

Delete Gas Variance. The purpose of Act 204 was to mandate solar water heating to get the state off of fossil fuels. Hawaii gas is made from oil. The legislature eliminated incentives for builders to install solar water heating systems. Builders are now incented to install gas heaters because of lower first cost. To correct this subversion of the mandate the gas variance should be deleted. The Gas Company will not be excluded from installing gas heaters. There are four opportunities for The Gas Company to sell gas.

- Gas can be used as a back-up for a mandated solar water heater
- Gas can be used if a variance is granted because solar water heater is not cost-effective
- Gas can be used if a variance is granted due to inadequate solar resource
- Gas can be used if a variance is grated for substitute renewable energy technology

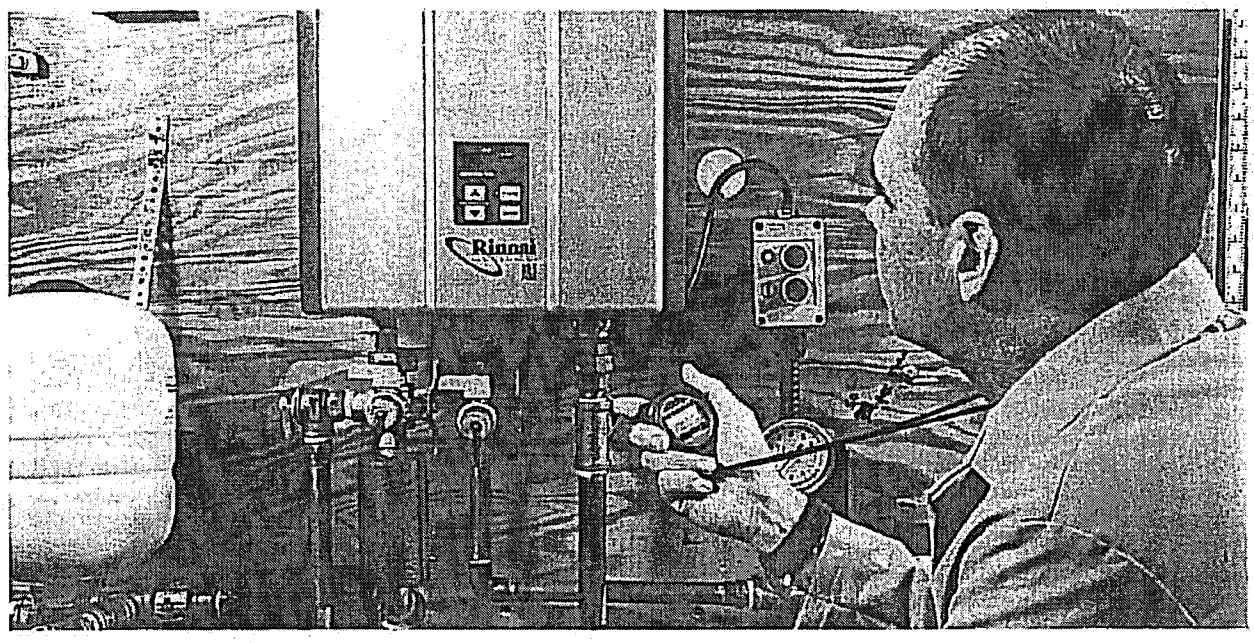
For the record, Inter-Island Solar Supply is one of the State's largest suppliers of gas water heaters. We are not opposed to the use of gas per se. We oppose it as a variance to a mandated solar water heater. Tankless gas heaters are not all that their cracked up to be. See the attached Consumer Reports article.

Require ENERGY STAR Heaters When Variances Are Granted. Variance should be granted only rarely if at all. If a bona fide situation arises that merits a variance, then the water heater used should be ENERGY STAR rated. ENERGY STAR ratings are available for many gas and electric heaters.

Reduce Tax Credits for Substitute Renewable Energy Technologies. If and when any variance is granted for the use of an eligible substitute renewable technology, the tax credit should be reduced by the amount that would have been allocated to a solar water heater absent the mandate. As currently written, SB390 SD1 incents builders to install substitute renewable technologies and not solar water heaters.

Require Substitute Renewable Energy Technologies to Produce Equivalent Solar Water Heater Energy. Section 2(a)(3) on page 2 at lines 1-3 provides for a variance to the mandated solar water heating system if "a substitute renewable energy technology systems, as defined in section 235-12.5, is used as the **primary** [emphasis added] energy source for heating water." The term "primary" is too general. Webster's definition of primary is "of first rank, importance, or value." Any substitute renewable energy technology system that contributes more than 50% to the water heating load would satisfy the provisions of this variance. Yet the "mandated" solar water heating system is presumed to provide that same level of savings as the current utility grade solar water heating system which, on average, contributes 90% of the water heating load. Therein lies the rub.

Please amend SB 390 SD1 as suggested.



WATER WORKS. Project leader John Banta checks the temperature and flow rate on a Rinnai model during our hard-water test.

Tankless water heaters

They're efficient but not necessarily economical

HEATING WATER accounts for up to 30 percent of the average home's energy budget. Some makers of gas-fired tankless water heaters claim their products can cut your energy costs up to half over regular storage heaters. So is it time to switch?

Probably not. Gas tankless water heaters, which use high-powered burners to quickly heat water as it runs through a heat exchanger, were 22 percent more energy efficient on average than the gas-fired storage-tank models in our tests. That translates into a savings of around $70 to $80 per year, based on 2008 national energy costs. But because they cost much more than storage water heaters, it can take up to 22 years to break even—longer than the 20-year life of many models. Moreover, our online poll of 1,200 readers revealed wide variations in installation costs, energy savings, and satisfaction.

With the help of an outside lab, we pitted Takagi and Noritz gas-fired tankless water heaters against three storage water heaters. We didn't test electric tankless heaters because many can't deliver hot water fast enough to replace a conventional water heater if groundwater is cold. Even in areas with warm groundwater,

What you'll pay

Tankless vs. storage-tank water heaters

We based our comparisons on natural-gas-fueled water heaters producing 75 gallons of hot water in a 24-hour period. Water was heated from 54° F to 124° or greater (a 70° temperature rise). Our costs are based on national averages and don't include rebates. Your costs may vary and could shorten or lengthen payback time.

	TANKLESS WATER HEATER		HIGH-EFFICIENCY TANK 50-gallon	STANDARD TANK 50-gallon
Model	Takagi T-K3	Noritz N-0751M	A.O. Smith Vertex GPHE-50	GE 5G50T12AVH
Retail price	$800	$1,150	$1,400	$480
Estimated installation cost	$1,200	$1,200	$500	$300
Annual operating cost*	$320	$330	$331	$400
Energy savings (annual over standard tanked unit)	$80	$70	$69	NA
Payback period (years)	15	22	16	NA

*We used the 2008 national average energy costs of $13.65 per 1,000 cubic feet (MCF) of natural gas and $0.108 per kilowatt hour of electricity.

most homeowners would need to upgrade their electrical service to power a whole-house tankless model.

Our tests simulated daily use of 76 to 78 gallons of hot water. That's the equivalent of taking three showers, washing one laundry load, running the dishwasher once (six cycles), and turning on the faucet nine times, for a total of 19 draws. While that's considered heavy use compared with the standard Department of Energy test, we think it more accurately represents an average family's habits. We also ran more than 45,000 gallons of very hard water through a tanked model and a Rinnai tankless model to simulate about 11 years of regular use.

Here's what else we found:

Water runs hot and cold. Tankless manufacturers are fond of touting their products' ability to provide an endless amount of hot water. But inconsistent water temperatures were a common complaint among our poll respondents. When you turn on the faucet, tankless models feed in some cold water to gauge how big a temperature rise is needed. If there's cool water lingering in your pipes, you'll receive a momentary "cold-water sandwich" between the old and new hot water. And a tankless water heater's burner might not ignite when you try to get just a trickle of hot water for, say, shaving.

Nor do tankless water heaters deliver hot water instantaneously. It takes time to heat the water to the target temperature, and just like storage water heaters, any cold water in the pipes needs to be pushed out. And tankless models' electric controls mean you'll also lose hot water during a power outage.

Up-front costs are high. The tankless heaters we tested cost $800 to $1,150, compared with $300 to $480 for the regular storage-tank types. Tankless models need electrical outlets for their fan and electronics, upgraded gas pipes, and a new ventilation system. That can bring average installation costs to $1,200, compared with $300 for storage-tank models.

Tankless units might need more care. During our long-term testing, an indicator on the tankless model warned of scale buildup. We paid $334 for special valves and a plumber to flush out the water heater with vinegar. Many industry pros recommend that tankless models be serviced once a year by a qualified technician. Calcium buildup can decrease efficiency, restrict water flow, and damage tankless models. Experts suggest installing a water softener if your water hardness is above 11 grains per gallon. Ignoring this advice can shorten your warranty.

Efficient storage models are pricey. We also tested the $1,400 Vertex, a high-efficiency storage water heater by A.O. Smith. The manufacturer claims its installation costs are similar to a regular storage model. But its high cost offsets much of the roughly $70 per year the Vertex will save you. Instead, we recommend buying a conventional storage water heater with a 9- or 12-year warranty. In previous tests, we found that those models generally had thicker insulation, bigger burners or larger heating elements, and better corrosion-fighting metal rods called anodes.

How to choose

Tankless models probably aren't for you if higher up-front costs and long payback are a concern. But they do use less energy and might make sense for long but infrequent use, such as back-to-back showers. Keep these points in mind:

Factor in location. Unlike a regular water heater, a tankless model's water output is immediately affected by ground-water temperatures. The same model that produces 7.2 gallons per minute (GPM) when installed in a warm Florida garage will output only 4.2 GPM in a cold New England basement because the colder water requires the temperature to be raised 77 degrees rather than 44. Use your coldest groundwater temperature to calculate the gallons per minute you'll need.

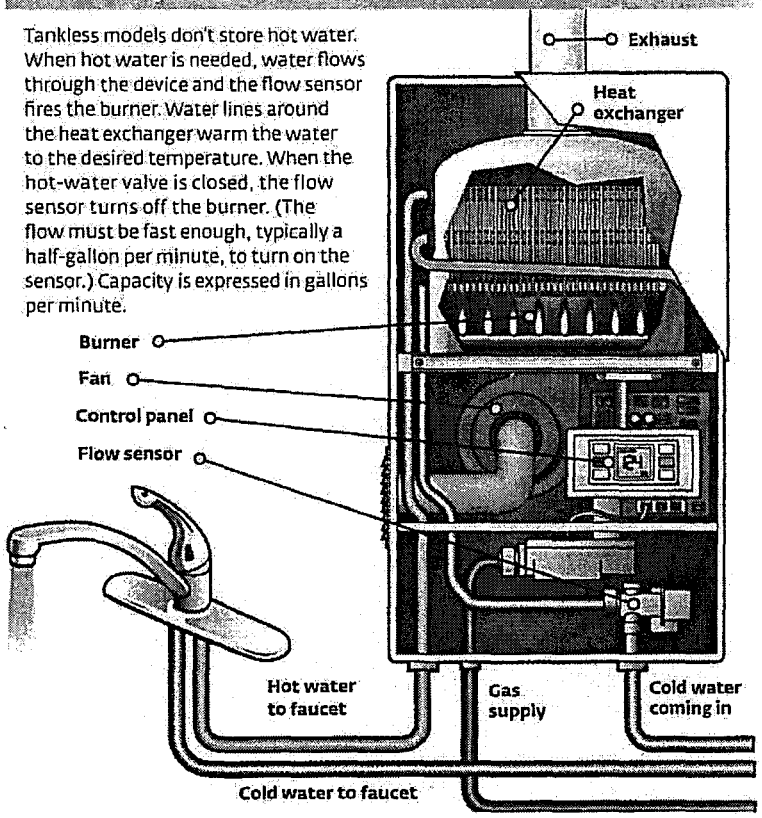
Know your flow. Undersizing a tankless water heater is a common mistake. Use our online calculator, at *www.ConsumerReports.org/hotwater*, to help you calculate your hot-water use.

Get the details right. Look for an oxygen-depletion sensor that shuts off the water heater if carbon monoxide is detected and a film wrap around the heat exchanger that will shut off the device if it gets too hot. Since tankless models are still relatively uncommon, consider using manufacturer-trained installers. Some companies extend the warranty if you do.

Look for rebates or incentives. Many tankless models qualify for utility rebates and state tax credits. Check the Database of State Incentives for Renewables & Efficiency at *www.dsireusa.org*.

How they work

Tankless models don't store hot water. When hot water is needed, water flows through the device and the flow sensor fires the burner. Water lines around the heat exchanger warm the water to the desired temperature. When the hot-water valve is closed, the flow sensor turns off the burner. (The flow must be fast enough, typically a half-gallon per minute, to turn on the sensor.) Capacity is expressed in gallons per minute.



Testimony Before the Senate Committee
On
Ways and Means

March 2, 2009 (9:30 a.m.)

S.B. 390 SD 1 RELATING TO ENERGY RESOURCES

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

Chair Kim, Vice Chair Tsutsui 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 S.B. 390 SD1.

HECO supports the intent of this bill to clarify the provisions of Act 204, with respect to new single-family dwellings and the variances for solar water heater systems.

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.

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 this opportunity to testify on this measure.

Suggested Amendments to SB 390, SD 1 (changes are highlighted in yellow)

SECTION 1. 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~~] public benefits fee administrator approves a variance. A variance shall only be approved if an architect or mechanical engineer licensed under chapter 464 attests that:

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

(2) Installation is cost-prohibitive based upon a life cycle cost-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 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 of this section in subsection (a)(1) and (a)(2) are met. For the purposes of this paragraph, "demand water heater" means a gas-tankless instantaneous water heater that provides hot water only as it is needed; or

(5) The public benefits fee administrator shall be responsible for post-installation verification inspections of the water heating technology installed pursuant to section 196-6.5.

(b) A request for a variance shall be submitted to the [~~energy resources coordinator~~] public benefits fee administrator on an application prescribed by the [~~energy resources coordinator~~] public benefits fee administrator and shall include, but not be limited to, a description of the location of the property and justification for the approval of a variance using the criteria established in subsection (a). A variance shall be deemed approved if not denied within thirty working days after receipt of the variance application. The public benefits fee administrator shall make public:

(1) All applications for a variance within seven days after receipt of the variance application; and

(2) The disposition of all applications for a variance within seven days of the determination on the variance application."

SECTION 2. Statutory material to be repealed is bracketed and stricken. New statutory material is underscored.

SECTION 3. This Act, upon its approval, shall take effect retroactive to July 1, 2009.

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Via Capitol Website

March 2, 2009

Senate Committee on Ways and Means
Hearing Date: Monday, March 2, 2009, 9:30 a.m. in CR 211

Testimony in Opposition to SB 390,SD1 – Relating to Energy Resources
(Amends law mandating solar water systems for single-family dwellings and clarifies variance procedures and authority.)

The Honorable Chair Donna Mercado Kim, Vice-Chair Shan S. Tsutsui
and Ways and Means Committee Members:

Dear Chair Kim, Vice-Chair Tsutsui and Members:

My name is Dave Arakawa, and I am the Executive Director of the Land Use Research Foundation of Hawaii (LURF), a private, non-profit research and trade association whose members include major Hawaii landowners, developers and a utility company. One of LURF's missions is to advocate for reasonable and rational land use planning, legislation and regulations affecting common problems in Hawaii.

While LURF and its members support and employ solar energy or comparable renewable energy devices, we must respectfully testify **in strong opposition to the current version of SB 390, SD1,** based on, among other things, the following grounds:

- **Wait until the economy (and technology) gets better – "Given the current fiscal difficulties, it would not be prudent to pursue enactment at this time."** Act 204 (2008) and this bill, will not only mean increased costs and additional requirements and regulation to new homeowners and residential developers, it will also mean an increase in the costs of government to enforce the new laws – as the various state departments have repeated in their testimony this session – "Given the current fiscal difficulties, it would not be prudent to pursue enactment at this time."

- **Incentives should be provided for installation of solar water hearing systems.** Instead of mandatory legislation, the legislature should encourage making solar thermal energy devices or comparable renewable energy devices cost-neutral to new homebuyers and developers, by providing credits and incentives to developers to counteract the increased costs of such devices and the resulting increased prices of new homes.

- **If the system ain't broke, don't try to fix it.** As the solar industry and Hawaiian Electric Company (HECO) testified in 2008, the present system of rebates and incentives are working. Thus, LURF's position is that it is unnecessary for the state to enact mandatory solar water heater systems for all new single-family residential dwellings;

- **New homeowners should be allowed "freedom of choice" with respect to renewable energy products.** Individual homeowner choices such as installing a costly solar energy device should be left to each individual homeowner, rather than mandated by the government through legislation such as Act 204 (2008) and this legislation;

- **Substantial increase in the initial costs and mortgages for new homes.** A very serious impact of this bill is that it would increase the sales price and up front costs of new housing for homebuyers; the higher sales prices will detrimentally affect the ability to qualify for a mortgage loan;

- **Loss of tax credits and rebates for new home owners.** As explained in 2008, by the solar industry and HECO, mandatory solar laws will also cause the loss of tax credits for homeowners and will cause the loss of HECO rebates for homeowners.

LURF's Position. While we agree that we, as a community, should work to conserve more energy, we believe that the choice of energy conservation devices should be governed by market forces and government incentives, rather than by government regulations.

Based on the above, we respectfully request that **SB 390 be held** in the Senate Committee on Ways and Means.

Thank you for the opportunity to express our **opposition to SB 390**.

Hawaii Solar Energy Association
Serving Hawaii Since 1977

March 2, 2009
Room 211
9:30 A.M

Senate
Committee on Ways and Means
SB390 SD1

Mark Duda
President

SB390 SD1: Testimony in Support

Dear Chair Kim, Vice Chair Tsutsui and Members of the Committee:

Hawaii Solar Energy Association (HSEA) is comprised of more than 30 installers, distributors, manufacturers and financers of solar energy systems, both hot water and PV, most of which are Hawaii based, owned and operated. Our primary goals are: (1) to further solar energy and related arts, sciences and technologies with concern for the ecologic, social and economic fabric of the area; (2) to encourage the widespread utilization of solar equipment as a means of lowering the cost of energy to the American public, to help stabilize our economy, to develop independence from fossil fuel and thereby reduce carbon emissions that contribute to climate change; (3) to establish, foster and advance the usefulness of the members, and their various products and services related to the economic applications of the conversion of solar energy for various useful purposes; and (4) to cooperate in, and contribute toward, the enhancement of widespread understanding of the various applications of solar energy conversion in order to increase their usefulness to society.

HSEA members manufacture and install the vast majority of solar water heating systems deployed in the State of Hawaii. Our comments on this measure are based on this expertise, and our related experience in other renewable energy technologies.

Comments on SB390 SD1

1. **Support for the bill.** SB390 SD1 makes a number of important improvements on Act 204. HSEA strongly supports each of the proposed changes.

2. **Eliminating the Gas Loophole.** HSEA would like to note its strong preference for the provision in the original version of SB390 that eliminates the loophole allowing developers to comply using gas instead of solar – even in cases where the solar resource is sound and the payback is reasonable. HSEA notes that if the gas loophole were eliminated, nothing in Act 204 prevents the use of gas in cases where solar does not work well.

3. **Gas Loophole Reduces Solar Installations.** It is HSEA's belief that Hawaii will actually see fewer solar installations in the next two decades with Act 204 in effect than

without because of the existence of the gas variance. That is, "mandating" solar with a loophole allowing developers to comply using less costly gas water heating systems will cause most developers to install gas instead of solar so as to keep the initial selling price of the home lower. With the loophole in place, gas will dominate new construction in Hawaii for decades, one subdivision at a time. For this reason, HSEA advocates the elimination of the gas loophole in Act 204.

blue planet FOUNDATION

SENATE COMMITTEE ON WAYS AND MEANS
March 2, 2009, 9:30 A.M.
Room 211

(Testimony is 3 pages long)

TESTIMONY IN SUPPORT OF SB 390 SD1 WITH AMENDMENTS

Chair Kim and members of the committee:

The Blue Planet Foundation strong supports Senate Bill 390 SD1 with amendments, making clarifying amendments and improvements to Hawaii's historic Solar Roofs Act. 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.

We strongly urge the Ways and Means Committee to make at least one critical amendment to this measure: removing the "gas" variance option (original SB 390 language). 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.

Specifically, Blue Planet supports the following changes to Act 204 (Solar Roofs Act):

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

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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 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, but we don't think it is necessary to have a "retroactive" effective date of July 1, 2009.

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.