

IS PAYS® THE ANSWER TO FINANCING SOLAR WATER HEATING SYSTEMS?

Warren S. Bollmeier II
Hawaii Renewable Energy Alliance
46-040 Konane Place #3816
Kaneohe, HI 96744
wsb@lava.net

Harlan Lachman
Energy Efficiency Institute
165 Goodsell Point
Colchester, VT 05446
harlan@eeivt.com

Rep. Hermina Morita
House of Representatives
Hawaii State Capitol
415 South Beretania Street
Honolulu, HI 96813
repmorita@hotmail.com

ABSTRACT

The Pay As You Save® (“PAYS®”) system was created by the Energy Efficiency Institute, Colchester, Vermont and first described in a 1999 paper presented to NARUC, Pay As You Save® Energy Efficiency Products: Restructuring Energy Efficiency. PAYS® makes it possible for all customers to buy cost effective resource efficiency products by eliminating all market barriers to their purchase. The PAYS® approach has recently been applied to encourage the purchase and installation of Solar Water Heating (SWH) systems by renters and those without significant financial resources by making SHW purchases a “no-brainer” decision. Specifically, customers will buy PAYS® SWH systems with no upfront payment and little or no hassle. They will pay for their SWH systems over time on their utility bills with the assurance that in the near and long term they will save more than they pay. The paper will discuss the use of PAYS® for SWH systems in Hawaii and a comparison of PAYS® with other options for facilitating their purchase.

1. INTRODUCTION

Purpose: This paper addresses the question, “Is PAYS® the answer to financing solar water heating systems (SWH)?” The authors describe the Pay As You Save® system (PAYS®), Hawaii’s PAYS® solar water heating pilots (including current pilot results), and how PAYS® can be used to:

- create a program offer that makes residents and businesses, including those who rent their premises, want to install and pay for SWH;

- encourage capital providers, including states and municipalities with bonding authority, to make sufficient funds available to capitalize these investments; and
- lower public costs for promoting the sale of renewables.

The authors hope to convince readers that PAYS® is the answer to financing SWH because it allows vendors to make offers to potential customers that are too good to turn down and because in some areas of the country PAYS® can be used to effectively promote SWH at a lower public cost.

Description of PAYS®: PAYS® uses the same system responsible for building most of the power plants and natural gas systems in this country, the utility regulatory system. The utility regulatory system is a financial system able to commit future customers at locations to pay for current investments in energy supply and also any bad debt resulting from missed collections. With the threat of disconnection for non-payment of an essential commodity, the utility regulatory system has the highest collection rate of any financing system. In many states, bad debt is less than 1% of all collections. High collection rates backed by the assurance that any missed payments will be repaid by future rate payers ensure investors that they will be repaid regardless of who actually benefits from their investment (or even if no one benefits). PAYS® harnesses the utility regulatory system to tap the stream of future savings to pay for investments in resource efficiency.

PAYS® includes sufficient consumer assurances to create a program offer that is too good to turn down – even though the design concept is that participants pay 100% of

installation costs for the most cost effective measures, making rebates unnecessary for the most cost effective measures. Customers can install measures in their homes and businesses with:

- Independent certification that measures are appropriate and will provide net savings right away
- No upfront payment
- No credit checks, liens or hassles (e.g., dealing with a bank)
- No new debt obligation (the obligation to pay is assigned to the location not an individual)
- No obligation to pay if they don't personally benefit (e.g., if a customer relocates, their payment obligation stops; if a measure fails or breaks down, it is repaired or the payment obligation stops; if repaired, the payment amount stays the same, only the term is extended)
- No barriers to participation by landlords or tenants; tenants only pay a lower electric bill while they occupy the premises; landlords who don't pay energy bills pay nothing

PAYS® allows customers to purchase relatively risk free savings. That is why PAYS® efforts have proven in New Hampshire for energy efficiency measures and will soon for solar hot water systems in Hawaii that, "We couldn't have done it without PAYS®."¹

The essential elements that enable this offer to be made are:

- a tariff assigned to a meter location, not to an individual customer, so there is no individual debt;
- billing and payment on the utility bill with disconnection for non-payment so there is no need for credit checks or need for a lien; and
- independent certification that products are appropriate and savings estimates exceed payments (including all payments associated with installations and repairs), and ensuring participants that they will only pay while they personally save.

Each of these elements is required to effect PAYS® benefits. Efforts to market the PAYS® system have shown that another requirement for the PAYS® system to operate successfully is to have the utility offering the PAYS® tariff treat any PAYS® related bad debt the same as all other bad debt. This is required to ensure capital providers that they will be repaid. As long as a utility guarantees the capital provider repayment for a Commission-approved investment, just as they were willing to capitalize most of the nation's power plants, capital providers will capitalize resource efficiency and renewable energy investments.

¹ Quote from Stratford, New Hampshire Selectboard about first PAYS® product and verified by GDS Associates Evaluation.

2. Implementation of PAYS® in Hawaii - Solar Water Heating

Policy Initiative: On June 26 of 2006, Hawaii's Governor Linda Lingle signed Senate Bill 2957 (Act 240) into law. One of the changes mandated by this law (Part IV) required the Hawaii Public Utilities Commission (Commission) to implement a PAYS® SWH pilot². The legislature provided the following supporting arguments for this legislation:

"The legislature finds that the up-front cost of installation is a barrier preventing many Hawaii residents from installing solar water heating systems. The legislature further finds that the renewable energy technologies income tax credit and electric utility rebates have not been enough of an incentive to overcome these up-front costs, especially for rental housing and homes in need of retrofit for these important energy-saving devices. The purpose of this section is to authorize the public utilities commission to implement a pilot project to be called the "solar water heating pay as you save program".

HECO Companies Implementation: Although not required by the Commission to incorporate all key elements of PAYS®, the three utilities comprising the HECO Companies (Hawaii Electric Company, HECO; Hawaii Electric Light Company, HELCO; and Maui Electric Company, MECO) have implemented pilots that do adhere to all key elements of the PAYS® system. Any installation where all costs, less HECO Companies' \$1,000 rebate, can be covered by 80% of the estimated savings in less than twelve years can qualify for the PAYS® tariff.

KIUC Implementation: The fourth Hawaii electric utility, Kauai Island Utility Cooperative (KIUC), filed a tariff that does not comply with a key PAYS® element – specifically the requirement that participants receive independent certification and that they will save more than they pay in the near and long term. KIUC members, including renters, considering buying SWH using the tariff must:

- agree to pay a higher utility bill during the five year payment period than they would pay if they did not install a SWH, and
- assume responsibility for any repair costs, regardless of the amount, which will further worsen their monthly cash flow.

² According to the Chair of the House Energy Committee which originally drafted the legislation, the trademark required by the United States Patent & Trademark Office was mistakenly omitted from the legislation. Because of this omission, the Commission ruled on page 9 of its June 29, 2007 Order 23531 that, "...the utilities are not required to use the trademarked Pay As You Save® or PAYS® program to implement their SWH Financing Programs."

Additionally, any customers considering using this tariff to purchase SWH must forgo a \$1000 utility rebate (equal to approximately 20% of the system cost) available to all other customers installing SWH systems.

Initial Results: The following table shows the results of these utilities pilots as of February 29, 2008:

Utility	# SWH 07 - 08 Goal	# SWH 07 - 08 In-Progress	# SWH 07 - 08 Completed	# SWH 07 - 08 Total
HECO	100	22	29	51
HELCO	50	33	21	54
MECO	50	11	0	11
KIUC	25	0	0	0

Halfway through the first program year, the three HECO companies utilities appear to be making good progress towards using the PAYS® system to convince customers to buy the targeted number of SHW. To date, no KIUC customer has opted to use its tariff. KIUC customers interested in SHW have used KIUC’s loan or rebate programs.

Although the law was intended for customers for whom tax credits and rebates were insufficient to motivate the purchase of SWH and for customers living in rental housing ("underserved market segments"), the tariff was made available to all Hawaiians on a first come first served basis. As of the end of February 20 of the 116 units sold with the PAYS® tariff by HECO companies were sold to those who previously rejected offers without the PAYS® tariff, proving, or at least suggesting, that PAYS® can successfully enable purchase of SWH by those for whom rebates and tax credits are not sufficient incentives.

3. Traditional SWH Program Offers

Utility Rebates & Tax Credits: For years, tax credits and rebates have been used to successfully promote the sale of solar water heating systems. For example, Hawaii supplements the current Federal tax credit (30% of customer cost net of rebates up to \$2,000) with both a state tax credit (35% of actual cost or \$2,250, whichever is less) and a rebate from the customer’s utility of \$1,000. In Hawaii, for those with incomes high enough to let them take advantage of both tax credits, the net cost, after taxes, for a \$6,000 system is only \$2,750 (\$6,000 less \$1,000 from the rebate, less \$1,500 for the federal credit, and \$1,750 for the state tax credit). However, Hawaii’s legislature and governor have realized that even with Hawaii’s high energy costs, the market for rebates and tax credits is too limited. Tax credits are of little use to most Hawaiians, those with lower tax obligations. Additionally, tax credits and rebates are not sufficient to overcome the split incentive that inhibits

tenants who pay for energy costs and their landlords who don’t from installing SWH. As noted above, that is why the legislature created the PAYS® pilots.

Shortfalls of the Traditional Offers: The following chart shows some of the reasons why even people who have chosen not install SWH when offered rebates, tax credits and even financing, will want to install them with PAYS®, as demonstrated by Hawaii’s pilots.

Measure Features/ Benefits	Rebate/ Tax Credit	On Bill Financing	Property Tax Financing	PAYS®
No initial customer cost		√	√	√
No credit check or liens				√
Customer assumes no debt obligation				√
Customer is assured annual charge is less than savings				√
Payments end if measure fails and is not repaired				√
Payments end if customer relocates			√	√
Serves tenants and developers				√
Requires ratepayer or public funds	√			
No Free riders		√	√	Moot

The table above compares the PAYS® offer to the offers of traditional rebate and tax credit programs, on-the-bill financing programs (without rebates), and the innovative property tax financing program envisioned by the city of Berkeley, California to put the cost of photovoltaic panels on residents’ property tax bills.

The reason the PAYS® offer appears to be more attractive is its assurances that eliminate risks for purchasers. Those who purchase SWH with PAYS® are assured estimated savings are significantly more than costs from day one. They risk none of their money with any upfront payment. They are assured they only pay while they reside at the location and only for as long as the system continues to function.

If the system requires repairs, their monthly costs do not increase. They assume no risk from assuming additional debt (which might limit their borrowing power for other, perhaps more important needs). The system also meets the needs of tenants responsible for energy bills and their landlords who are not. And, for the most cost effective measures, once the system is in place, no public funds are required. (NOTE: since customers pay 100% of measure costs that benefit them, the concept of free riders does not apply to PAYS®; there is no free ride).

4. Next Steps - PAYS®

What is Needed for PAYS®: PAYS® requires approval of a tariff for a utility providing an essential service (e.g., electricity, gas, water) with a monthly bill. There are other key components to the system, for example a capital provider and a certification agent. However, the tariff is the cornerstone.

Right now, the only states using the PAYS® system are Hawaii and New Hampshire. But there is little information about this unique system and little public demand from consumers, vendors, and policy makers. The authors hope that this paper will inspire those interested in promoting resource efficiency, especially renewable technologies, to take a look at PAYS® (information is available at www.paysamerica.org). If enough people think it makes sense and contact their public utilities commissions or unregulated municipal utilities, given the public’s interest in climate change and lowering public and their own costs, who knows what is possible?

PAYS®, a Better Public Deal: Another reason why PAYS® is the answer to financing SWH is that for those jurisdictions where SWH is very cost effective (e.g., Hawaii), it requires less public funding to encourage the sale of SWH than tax credits or fixed rebates and would reach more customers (e.g., renters, those without capital or debt capacity, and those unsure how long they will remain in their premises). In jurisdictions where SWH is less cost effective, it helps policy makers evaluate how much incentive would be required to enable most customers to purchase systems and whether this money should be made available.

Most resource efficiency rebates and tax credits are not tied to the cost effectiveness of an individual project but to an amount policy makers determine is publicly affordable and/or which might be sufficient to convince some people to buy resource efficiency measures. For example, solar tax credits are the same for installations costing the same amount regardless of the amount of hot water usage, solar insolation at a site, or avoided energy costs (which combined will determine the value of savings).

In order to qualify measures for the PAYS® tariff, in other words, to assure a customer that savings from an installation will produce immediate net savings, for measures such as SWH some level of subsidy will be required. Right now, SWH is not sufficiently cost effective to ensure immediate positive cash flow if customers pay for 100% of the costs.

It is instructive to compare the amount of public subsidy required to qualify SWH for the PAYS® tariff to the current levels of available public funding. For example, in Hawaii, as noted above, public funding totaling \$4,250 is available for a \$6,000 SWH heating system. Yet even with this amount, the legislature and governor have determined rebates and tax credits are not enough to enable most customers to purchase SWH systems. In California, although there are legislative and regulatory proposals to allow utilities to offer rebates, only the federal tax credit is available at the time this paper was written.

The following table shows how much public funding is currently available to facilitate purchase of SWH in four different locations. It also shows how much public funding, not counting existing rebates and tax credits, would be needed to qualify a SWH costing \$6,000 for the PAYS® tariff for a family of four regardless how they heat hot water (i.e., with gas or electricity).³

Features (Part 1)	Oahu Elec.	Oahu Gas	Maui Elec.	Maui Gas
Rate	24.8¢	\$4.34/gal	32.6¢	\$4.40/gal
Available Rebate & Tax Credits	\$4,250	\$3,900	\$4,250	\$3,900
Rebate Needed for PAYS®	\$1,900	\$1,575	\$ 500	\$1,400
Monthly Charge	\$37.92	\$40.93	\$50.87	\$42.54
Monthly Savings	\$47.41	\$51.30	\$63.73	\$53.19

³ Assumptions: interest rate; 5%. System cost: \$6k (ignoring rebates and tax credits); Qualifying SWH: Costs must be able to be covered by 80% of current savings; BTU content: 92,000 btu/gal propane, 3,413 btu per kWh, 100,000 ccf; Savings: Oahu 2294 kWh annual savings, Maui MECO 2346 kWh, San Francisco 2,592 * 80% kWh, Generic 2,300 kWh; Gas Savings: Oahu 141.84 gal (3413*2294/9200/.6), Maui 145.05 gal (3413*2346/92000/.6), San Francisco 191 therms x 80%; and Assumed gas heater seasonal efficiency: 60%.

Features (Part 2)	San Fran Elec.	San Fran Gas	Generic Elec
Rate	16.3¢	\$1.26/CCF	22¢
Available Rebate & Tax Credits	\$1,800	\$1,800	\$1,800
Rebate Needed for PAYS®	\$3,575	\$4,625	\$2,375
Monthly Charge	\$22.43	\$12.72	\$33.53
Monthly Savings	\$28.17	\$16.04	\$42.17

As a society if we really want to promote resource efficiency and renewables as part of a comprehensive climate change effort, the best investment vehicle is PAYS®. Not only can it reach more types of customers, in some locations it can do so for less public money. In others, it helps policy makers to consider the real cost to make SWH attractive to all potential customers.

The monthly PAYS® charge is fixed and does not increase over time. In the example above, the charge is spread over twelve years. However, to recover any missed payments or required repair costs, the term can be extended as long as the system is still functioning. The value of the savings, on the other hand, will increase with every utility rate increase. While the spread between the savings and charge is now small, it will soon become much larger. Additionally, considering all of the PAYS® guarantees, PAYS® is the best way for consumers and businesses to participate in climate change efforts and immediately save money.

The table clearly shows that for a state such as Hawaii, where SWH is very cost effective, if the PAYS® tariff were made available to all customers, it would require less public money to qualify SWH for the tariff than is currently being offered in the form of rebates and tax credits. More importantly, with PAYS®, all customers could purchase SWH.

While SWH is not as cost effective an investment in other places in the country as it is in Hawaii, it can still make sense if done in conjunction with a PAYS® tariff. As the table above shows, anywhere customers heat hot water with electricity and electric rates are \$0.22/kWh or higher could provide a good location for a PAYS® SWH program with a public subsidy of 2,375 per unit. Making such funds available to enable all customers to install SWH is likely still good public policy if policy makers consider the societal costs of climate change, limited fossil fuels, increasing transmission and distribution costs, less centralized energy production, etc. The benefit of PAYS® is that it forces policy makers to look at the equation from the perspective of the participant, those who we want to purchase and use SWH. Policy makers may still decide that tax credits or smaller rebates are preferred; but they will do so only if they believe public funding is insufficient to make SWH cost effective for all customers with current energy costs but still want to encourage installation by early adopters.