

State Energy Efficiency Policies Options and Lessons Learned

A Series of Briefs

Brief #3

Paying for Energy Upgrades Through Utility Bills

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Creating an Energy-Efficient World

Paying for Energy Efficiency Upgrades Through Utility Bills

Policy Description

On-bill loans and tariff-based financing systems are utility programs designed to help customers pay for energy efficiency upgrades through energy savings.¹ These programs are set up so that the utility covers the cost of the upgrade and the customers pay the utility back through a charge on their monthly utility bill. This allows for a streamlined process as utilities already have an established billing relationship with their customers, as well as access to information about their energy usage patterns and payment history. This system helps overcome some of the common barriers to energy efficiency, including up-front capital cost and the complexity involved with taking out a loan from a third-party lender that requires payment through a separate invoice.

While the electric and natural gas utilities run these programs, state governments can adopt legislation or regulations that encourage and enable their adoption. For example, states could require public utility commissions to investigate the feasibility and desirability of such programs, enact laws that provide capital for on-bill programs through public benefit or other funds, establish energy efficiency goals and encourage regulators to adopt rate structures that remove disincentives to investing in energy efficiency and facilitate such investments. Such encouragement from the states is important for utility participation in the program also because on-bill financing programs are not simple to design, may require an expensive overhaul of old billing systems, and put the utility in the role of a lender – something that is outside the traditional utility expertise and business model.

On-bill programs are still uncommon, but they are attracting increasing interest in many states. States and utilities interested in implementing an on-bill financing program to support energy efficiency have

two different financing mechanisms at their disposal: on-bill financing through a utility tariff (tariff-based systems) and on-bill financing through loans from the utility company (on-bill loans).

On-bill tariff systems and loans generally work in the following way:

In both the tariff and loan based systems, the utility pays for the full installed cost of the efficiency measures and the consumers pay a monthly fee on their bills to compensate the utility, in addition to the standard charges for energy delivery.² The fee consists of both the principal and the financing charge, which can be reduced by subsidies from the government. Some key aspects of the tariff and loan systems are discussed below:

Assignment of Repayment: The major difference between tariff and loan systems lies in whether the individual or the meter is assigned to repay the cost of implementation. In the tariff-based system, the charge is tied to the meter, not the customer, so the tariff stays with the meter when the customer moves, to be paid by the next occupant in the same way.³ This is important because it allows for a long payment term that could approach the payback period of the energy efficiency measure, which decreases monthly payments for the efficiency measure. It also encourages renters to participate in the program because they only pay for energy saving measures while they benefit from them, and remain in the premises.

Since the charge is assigned to the meter and not an individual, in some jurisdictions the tariff-based charge is not considered a loan; it is simply a part of the consumer's utility bill. This could be attractive because it will not appear on the consumer's credit report, or

– in the case of governments that are restricted from taking on new debt – may enable them to participate in the program. One tariff-based system run by the multi-state utility PacificCorp, Energy FinAnswers, called the energy services charge an obligation and did not take a position on whether or not it was debt.⁴ Other currently operating tariff-based programs do not classify the tariff as debt.⁵ These programs are in operation in New Hampshire, Hawaii and Kansas and are all based on the Pay As You Save (PAYS®) system, the best-known of the tariff-based programs.

Regulatory Review: In the case of on-bill loans the utility need not apply to the commission for regulatory approval in the same way that it requests approval of a new tariff, although in many cases the utility may still request this approval in order to keep the commission comfortable with and informed of its activities. In tariff-based systems, the regulatory approval requirements depend on the type of utility: for investor-owned utilities, a utility must apply to the utility commission for approval of a regulated tariff as part of an energy efficiency financing program while non-investor-owned utilities can begin such programs on the approval of their board. Thus loans may be easier for utilities to adopt than tariffs.

Financing Term: In both types of programs, the decision as to the financing term (the length of time over which to spread out payments) rests ultimately with the program administrator and often, the public utility commission. The financing term is usually equal to or shorter than the life of the measure, since once the measure is retired, it is no longer producing any energy savings. As explained above, the term of the financing is often shorter in an on-bill system than it is in a tariff-based system. This means that the customer has a shorter period over which to amortize the capital cost of the efficiency equipment. If the goal of these programs is to have monthly energy

cost savings exceed monthly principal and interest payments – as it is in almost all cases – this shorter amortization period makes it more challenging for some higher-cost items to qualify for these programs without an additional subsidy or rebate.

Auditing and Eligible Measures: In the case of both on-bill loans and tariff systems, the customers choose energy efficiency measures based on an energy audit or from a list of prescribed measures identified by the program. Connecticut-based United Illuminating, for example, offers a no-obligation energy audit. If the customer accepts the audit recommendation and goes forward with the project, the vendor folds the cost of the audit into the project. Both types of programs typically determine eligible measures – such as energy-efficient lighting and heating, ventilation and air conditioning system upgrades – based on their initial cost and the payback time. In most cases measures for which the monthly principal and interest payments would exceed the monthly energy savings do not qualify. The list of measures that qualify may vary greatly depending on the sector (government, residential, or business) and the financing term used by the program. A program could also be designed to focus on specific technologies for a specific sector – residential street lighting for a municipal government customer, for example.

Measure Failure: Under the tariff-based system design, the customer is typically assured that if the energy efficiency technology fails during the payment period, it will either be repaired or their payment obligation will stop. Repairs will not increase the customer's monthly payment amount, but if the repairs fall outside the term of a warranty, the term of payments could be extended to pay for repair costs.⁶ On-bill loan programs vary in their treatment of this issue but typically state that the utility will repair or replace a measure if it fails during the term of the loan.

Marketing: Utilities market these programs in a variety of ways depending on the targeted sector. A small business or residential program could be marketed through a network of trained contractors, while a program to finance municipal government energy efficiency programs could be marketed directly to that government entity.

Sectors Served: The on-bill tariff system has been used across residential, government and commercial sectors, while the on-bill loan is more restricted in use. On-bill loans may be unattractive in the residential sector due to state consumer finance laws, which vary from state to state. For example, Sempra, a large California utility, cited consumer finance laws as the reason for their focus on the small business sector. Government may also be restricted from on-bill loans because they constitute a multi-year debt commitment, not allowed by many government entities and not required for the on-bill tariff programs.⁷

Non-payment Penalties: Finally, both systems can be structured so that customers are subject to the same payment requirements and non-payment penalties as with the rest of their monthly energy bill.⁸ On-bill tariff agreements often include a failed payment disconnection penalty that creates a more secure payment stream with a lower risk of default than a conventional third party loan.⁹ Where utilities issue bonds to provide program capital, the disconnection agreement lowers the financing cost of the program because bond-rating agencies award lower interest rates to bonds with more secure revenue streams.¹⁰ However, utilities use public benefit funds to capitalize both types of programs in most cases, and some utility representatives express reluctance to use the disconnection provision.¹¹ On-bill loan programs have not typically been designed with a disconnection provision in place, although it would be possible for such a provision to be incorporated in these programs.

Some of these programs require that the customer/borrower provide some type of collateral and default often results in referral to a collection agency.¹²

Current Status and State Experience

Neither on-bill tariff nor loan systems are currently common, in part because they have not been tested widely and because many utilities (like PacifiCorp as discussed below) hesitate to become involved in financing for energy efficiency measures. Further complicating these systems is the fact that utilities must modify their billing systems to assign a new ongoing payment obligation. Nonetheless, these on-bill financing programs currently operate in a number of states and interest in these programs appears to be growing.¹³ The remainder of this paper discusses several of these existing programs in more detail.

On-Bill Loan Programs Overview

The following table lists the utilities that currently operate on-bill loan programs, many of which have tended to focus on the small business or government sectors. These on-bill loan programs are available for loan amounts of up to \$250,000 and the maximum loan term varies between 24 and 60 months. Interest rates for the programs listed below are subsidized and are more favorable than would otherwise be available in the market, often set at zero percent. In general, the combination of longer terms and lower rates makes it easier for monthly energy cost savings to exceed monthly repayments for these loans.

On-Bill Loan Programs: Practical Experiences

This section describes the on-bill loan programs, based on interviews with the program managers in Connecticut and California. These programs are selected both because they are among the largest

Table 1: On-Bill Loan Programs

Program Name	Utility	Source of Funds	Interest Rate	Maximum Loan Amount	Maximum Term	Program Budget (\$ millions)	Annual # of Projects
ERC Loan Program	Dixie Electric Cooperative (AL)	n/a ⁱ	5%	\$5,000	60 months	n/a	n/a
Home Improvement Loan Program	First Electric Cooperative (AR)	n/a	5.5%	\$15,000	60 months	n/a	n/a
On-Bill Financing Program	Southern California Edison (CA)	Public Benefit Funds	0%	n/a	60 months	n/a	n/a
On-Bill Financing Program	San Diego Gas and Electric (CA)	Public Benefit Funds	0%	\$100,000 for business and \$250,000 for government sector	60 months	n/a	n/a
On-Bill Financing Program	Southern California Gas Company	Public Benefit Funds	0%	\$100,000 for business and \$250,000 for government sector	60 months	\$1.25	n/a
Small Business Energy Advantage	United Illuminating Company (CT)	Public Benefit Funds	0%	n/a	36 months	\$1.6	310
Small Business Energy Advantage ⁱⁱ	Connecticut Light and Power (CT)	Public Benefit Funds	n/a	n/a	30 months	\$7.5	955
Small Business Energy Advantage	Western Massachusetts Electric (MA)	n/a	0%	n/a	n/a	n/a	n/a
Small Business Program	National Grid (MA, NH and RI)	Public Benefit Funds	0%	\$50,000	24 months	\$9.7	1,625

ⁱ n/a = information not available.

ⁱⁱ This program is in transition; the utility currently offers a loan to its customers but sends two bills, one for the loan and one for the utility bill. The utility is currently making the computer system changes necessary to put the loan on the utility bill. (Steve Bruno, Connecticut Light and Power, personal Communication, June 2008).

such programs in the country and because they offer examples of experiences in two different geographic areas.

United Illuminating Company Program (Connecticut investor-owned utility)

The United Illuminating Company's (UI) on-bill loan program focuses on commercial and industrial customers with an average peak demand of 150 kW or less, and it only finances projects if the monthly

energy savings exceed the monthly principal and interest charges. This financing program is composed of a combination of rebates and loans. UI uses proceeds from the Connecticut Energy Efficiency Fund (the state's Public Benefit Fund) to offer rebates to customers of roughly 30 to 40 percent of the total project cost, and then it offers customers who qualify zero-percent financing on the remaining portion, also using public benefit funds to cover the interest rate reduction to zero percent. The program, which has been in operation since 2000, has paid out \$6.9

Table 2: Payback and Monthly Payments for a Hypothetical Loan With 3 Different Loan Terms

Assumptions:

Annual Energy Savings	42,301 kWh
Annual Energy Cost Savings	\$6,927
Monthly Energy Cost Savings	\$577

Assumed Loan Term	16 Month Term	24 Month Term	36 Month Term
Material Costs	\$9,204	\$9,204	\$9,204
Labor Cost	\$6,571	\$6,571	\$6,571
Tax (CT 6%)	\$947	\$947	\$947
Total Project Cost	\$16,722	\$16,722	\$16,722
Approved UI Rebate	\$7,887	\$7,887	\$7,887
Net Total Project Cost	\$8,835	\$8,835	\$8,835
<i>Monthly 0% Loan Payment</i>	<u>\$552</u>	<u>\$368</u>	<u>\$245</u>
<i>Difference Between Energy Cost Savings and Monthly Payments</i>	<u>\$25</u>	<u>\$209</u>	<u>\$332</u>

Source: Dennis O'Connor, United Illuminating Company, June, 2008

million in rebate incentives for energy efficiency while loaning \$21 million through the on-bill financing program.

In 2007, UI selected 14 contractors to provide energy efficiency services to customers. The contractors install the measures, and they are also responsible for securing a certain number of business leads each month. According to utility staff, the program requires very little marketing and is doing as much business as it can handle.¹⁴ As a result, the utility has reduced its marketing budget and put the extra funds into rebates and loans.¹⁵

UI found that, by extending the payback period, it was able to approximately double the number of program participants. Table 2 illustrates that, for the same hypothetical project, extending the loan term from 16 months to 36 months allows the customer to increase the monthly cash savings significantly during the initial months.¹⁶ The overall savings however are similar among the loans with different term lengths.

The program's total budget for rebates in 2006 was \$1.6 million and an additional \$3.2 million in utility funds for loans.¹⁷ The program financed 310 projects in 2006 that saved 5.8 MWh and 1.7 MW of demand savings. Between 2000 and 2007 the program financed 2,450 projects with 670,000 lifetime MWh saved.¹⁸

UI does not perform a credit check on its borrowers, but instead it looks to the customers' payment history.¹⁹ Total loan defaults over the life of the program are under \$200,000 – less than one percent of total loans and the loans are secured by the Connecticut Energy Efficiency Fund.

Connecticut Light and Power, another utility in the state, operates a similar program, also with support

from the Connecticut Energy Efficiency Fund. This program is larger, having completed 955 projects in 2006, achieving 32.5 MWh of energy savings and 8.5 MW of demand savings, with a \$7.5 million budget that year.²⁰

Sempra Energy (California)

Sempra Energy, the parent company of Southern California Gas and San Diego Gas and Electric, launched its on-bill loan program in late 2006 with financing from the state's public benefit fund to cover a rate buydown and the loan program capital. Sempra manages two separate but largely similar programs for each company.

A notable difference between these programs is their billing systems, which can be very important in determining the success of a program. San Diego Gas and Electric experienced difficulties adjusting the billing system to accommodate on-bill financing because it did not have a similar financing program already in place, while Southern California Gas' billing system was better set up to accommodate on-bill financing for energy efficiency upgrades. One typical hurdle in the adaptation of a billing system to on-bill financing is the question of how to divide the funds in the event that a customer makes a partial payment.²¹ The Sempra utilities have since overcome these hurdles and smoothed out their billing systems.

Both programs offer on-bill unsecured loan financing for energy efficiency at a zero percent interest rate. The programs initially offered a loan term of three years for business loans and five years for government loans. After assessing the effects of longer term loans on credit risks and looking at the financial benefits to customers of extending the loan terms, Sempra elected to offer a term of up to five years for business customers and up to ten years for govern-

ment customers. Sempra offers a longer term for government customers because it concluded the governments have, in general, a lower overall credit risk than the businesses do. It does not offer loans to residential customers because consumer finance laws in the state impose restrictions and additional fees on companies offering financing to this sector. Furthermore, while a business customer participating in the program can be disconnected for non-payment, staff at Sempra felt that the utility commission would be less likely to approve a similar disconnection provision for residential customers.²²

In addition to on-bill loans, the financing program can be combined with rebates of approximately ten percent of the total project cost. Loans are capped at \$100,000 for business loans and \$250,000 for government sector loans. The program had initially set a cap of \$50,000 both for business and government loans.²³

The program design aimed to provide at least bill neutrality, so the customers' energy savings offset any required loan payments. The company achieved this through a zero-percent interest rate, extension of loan terms and some rebates. The San Diego program is focused on electric measures, and lighting measures have predominated. These projects have typically cost around \$9,000. The Southern California Gas program has done custom projects that have tended to be closer to the original cap of \$50,000. In general, these gas projects have been more challenging to finance because of their higher costs and longer payback periods.²⁴

The company initially allowed any contractor that met state licensing standards to participate in the program, but it is now moving towards a system through which it will select contractors and require those contractors to go through an education process. This

change resulted from a number of jobs done poorly that left the liability for fixing those jobs – and the need to return to the job site – with the utility.

The energy savings results of free ridership in the program have not yet been evaluated. However, the program staff noted that they are “pretty confident that the projects would not be happening without the loans,” based on anecdotal evidence and discussions with customers.²⁵

Tariff Systems Overview

The tariff systems that are currently in operation throughout the country are still new, with a limited but growing body of state experience. All but one of the existing tariff systems started with the idea of creating a PAYS[®] system. The following is an overview of the status of all tariff-based programs in the states:

- PacifiCorp's tariff-based system, which operated in the late 1980s and early 1990s, was the first on-bill financing program in the US.²⁶ PacifiCorp is a multi-state utility operating in the western United States. State involvement in this program varied, but was generally limited to utility commission oversight or program approval. It included a technical energy assessment component to give advice on what energy efficiency measures to install in addition to the financing component of the program. The program offered an unsubsidized, market-based interest rate and financing terms that, in many cases, were shorter than the lives of the corresponding measures. This was not as attractive to customers as one that offered a subsidized interest rate.²⁷ By 2000, the company had, for the most part, terminated its on-bill financing programs due to diminishing customer interest in the financing component of its Energy FinAnswers program.²⁸ PacifiCorp still manages

the loan portfolio for any remaining Energy FinAnswers loans, but the utility would prefer not to be in the business of managing a loan portfolio because it does not wish to continue to evaluate and manage credit risks. Instead, it would prefer that third-party financial institutions provide capital funding for energy efficiency.²⁹

- New Hampshire ran a pilot program, after receiving state utility commission approval, for PAYS[®] at two utilities – Public Service New Hampshire (PSNH) and New Hampshire Electric Cooperative (NHEC). The pilot programs took place between 2002 and 2004. An independent program evaluator conducted an extensive evaluation of the programs, the results of which are summarized in the following section. In 2004, the commission determined the pilot to be successful and ordered these utilities to continue to offer the tariff with minor changes.³⁰
- Midwest Energy, a Kansas cooperative utility, is administering a tariff-based system called HOW\$MART.³¹ HOW\$MART includes all PAYS[®] elements, except that building owners (rather than bill-payers) must agree to assume responsibility for measure repair so it is possible that building owners will end up paying for savings they do not receive.³² This issue of whether the landlord or tenant pays for energy improvements and the upkeep and repair of energy efficiency measures is important in rental situations. This is because of the split incentive for energy efficiency – the tenants, not the landlords, pay utility bills, so the landlords have little incentive to make the capital investments necessary to save energy. PAYS[®] America, the non-profit that licenses the trademark, felt that this might be a significant barrier that could discourage landlords from participating in the program.³³
- Hawaii enacted legislation in 2006 requiring its utilities to implement pilots based on the PAYS[®] system. On June 29, 2007, the commission approved the applications by Hawaiian Electric Company, Inc., Hawaii Electric Light Company, Inc. and Maui Electric Company, Ltd. to implement PAYS[®] pilots for the installation of solar water heaters called SolarSaver.³⁴ In the first six months of the pilot programs, 122 solar water units, out of a target of 200 units, had been installed.³⁵ This program shows the potential to use a tariff-based system for renewable as well as energy efficiency measures.
- In 2008 Michigan adopted Public Act 285, which required the state's Public Service Commission to conduct an investigation of a tariff-based system. At the time of this writing, no changes have been implemented.
- New York State has encouraged its utilities in 2008 to explore a tariff-based system that it calls Conservation Tariffed Installation Program (CTIP). The New York Public Service Commission is in the midst of a two year Energy Efficiency Portfolio Standard Docket that will investigate this program.³⁶

Tariff-Based Systems: Practical Experience

Since tariff-based systems are not widespread, there is limited data on their effectiveness in energy reductions and customer participation. This section summarizes the process evaluation of the PAYS[®] system pilot programs in New Hampshire, which went into effect five years ago.³⁷

The PAYS[®] programs in New Hampshire were run by the New Hampshire Electric Cooperative (NHEC), a cooperative utility, and Public Service New Hampshire (PSNH), an investor-owned utility. The PSNH pro-

gram, now called Smart\$start, focused on financing energy efficiency improvements (energy-efficient street lighting) for a municipal government, and the NHEC program focused on electric and liquefied petroleum gas efficiency improvements such as lighting, weatherization, water saving devices and heating ventilating and air conditioning upgrades. The pilot program has now ended, and has been folded into the utilities current energy efficiency programs. This evaluation made the following conclusions:

- These programs resulted in installation of more total energy efficiency measures than would have happened in the absence of these programs. 91 percent of survey respondents said they would not have installed the new energy efficiency measures without these financing systems. Results varied somewhat, however, between the two programs.³⁸
- The electric heating program was successful in recruiting customers, but the customers also used rebates for energy efficiency that the utility offered through a separate program, so it is unclear what portion of the results can be attributed to the PAYS[®] program. The majority of participants required both the utility rebate and this financing system to undertake their projects.
- According to the survey conducted as a part of the evaluation, NHEC's lighting pilot program was also successful, with 85 percent of the participants stating they would not have purchased the lighting products in the absence of the financing program. The lighting retailers interviewed for the evaluation suggested that the program generated additional business and was successful.
- Some participants noted that it was hard to distinguish between the effects that energy efficiency measures had on their bill compared to the effects of normal fluctuations.

- New Hampshire programs were successful in overcoming a number of market barriers such as the high initial costs of energy efficiency upgrades and the restrictions on municipal governments regarding long-term debt.
- There was some concern at the outset of the program that three PAYS[®] program requirements could pose a barrier to large-scale participation in the program. According to participant surveys, at least one of the requirements listed below presented a barrier to participating in PAYS[®]. This survey was conducted only after 18 months of program experience however, so there was insufficient data to present a solid conclusion.
 - Sellers were required to disclose a property's participation in PAYS[®] to buyers, which might make a potential purchaser nervous about buying the property.
 - Property owners had to maintain the equipment, which might lead to additional and unforeseen costs for the property owner.
 - Non-payment would result in disconnection, just as with any other non-payment of electric bills.

In the seven years of PAYS[®], PSNH completely exhausted its allocation for the programs. Thus it can be concluded that PAYS[®] hit the targeted level of participation even with the above barriers and an additional twenty percent reduction in available rebates.³⁹

Complementary and Alternative Policies to Energy Efficiency On-Bill Financing Programs⁴⁰

On-bill financing systems work well in combination with the following policies and programs:

- On-bill financing systems can be paired with state public benefit funds to buy down an interest rate, establish a loss reserve to cover potential customer payment defaults, provide capital for a loan program or provide a rebate to reduce the project cost and consequently shorten the pay-back period.
- Regulatory policies that encourage utilities to develop and run energy efficiency programs can be vital to the success of on-bill financing programs as, in many cases, these programs are not financially attractive to the utilities without added incentives. Possible methods of encouragement include performance-based financial rewards for running successful energy efficiency programs and profit restructuring mechanisms that address the throughput incentive – the direct link between utility profits to amount of energy sold. Mandates such as an energy efficiency resource standard (EERS) could also encourage utility participation in on-bill financing programs because the financing programs can serve as a way to meet the EERS requirement.
- Third-party (i.e. non-utility) financing may be a viable alternative to on-bill financing systems provided through a utility. Third-party financing is covered in the second brief in this series, which addresses loan programs.

Observations About On-Bill Loans and Tariff-Based Systems

Although both systems are in limited use at the moment, it is possible to make a number of observations about them:

1. On-bill loan and tariff-based programs may have significant potential to engage consumers in

increasing energy efficiency. Evaluation of the New Hampshire pilots were generally positive and indicated that such a program would have the potential to overcome the initial cost barrier to financing energy efficiency and to provide a streamlined way to give consumers access to financing. Experiences in other states, however, may expose regional differences and allow further refinement of the concept.

2. Utilities may resist the implementation of on-bill loan and tariff-based programs. Different utilities react to these programs in different ways depending in part on the state laws and regulations regarding consumer financing. In addition, utilities may consider these programs a burden for three reasons:
 - Billing: On-bill financing measures may concern utilities whose billing systems are not set up to handle non-energy billing. The cost of revising a billing system will vary by utility. United Illuminating was able to integrate the billing for its on-bill financing program into existing financing programs, while Connecticut Light and Power had to rework its entire billing system to include on-bill financing. Additionally, PacificCorp and Sempra were able to integrate their programs into their billing systems, but staff noted that it was a challenge. Staff also noted that it was important to educate the customer service staff about the charge, since it was not common to all customer bills.
 - Liability for losses: Utilities may be concerned that as the billing entity, they could be liable for the defaulted loans of non-paying customers. In order to address

this issue, program designs should clearly identify how they will handle defaults. New Hampshire's program addresses this concern through the use of a system benefit charge-funded revolving loan fund to pay for the upfront cost of measures and the addition of a small charge to every project to ensure against bad debt. In Connecticut, the Department of Public Utility Control, which administers the state's public benefit fund, agreed that the fund would set aside a loss reserve to cover 100 percent of potential defaults.⁴¹ On the other hand, Sempra Utility's programs in California target the commercial and government sectors because the company felt it could limit liability losses by better analyzing and managing credit risks for these sectors.

3. Some utilities may hesitate to become directly involved in financing energy efficiency savings because it puts them in the position of acting as a financing institution. In some states, financing for the residential sector may subject the utility to consumer finance regulations that require registration and licensing as a consumer lender – processes that are outside a typical utility's expertise – as well as fees to register as a provider of consumer finance. In order to address this problem, program design should take into account state consumer finance laws. For example, California's program design focused specifically on business finance, in part for this reason. Also, PacifiCorp found that some state laws placed restrictions on the design of its programs.⁴² Connecticut's laws, however, did not impose additional burdens on residential financing programs.⁴³
4. On-bill financing programs can reduce the cost of capital for energy efficiency investments in cases where bonds capitalize the program. Because repayment through utility bills is considered a relatively secure payment stream, the bonds supporting the program are likely to receive good ratings which can reduce the cost of capital to finance energy efficiency measures.
5. Because the tariff-based system's payment obligation is tied to the meter, it is generally possible to have the payment obligation transfer when property changes hands. The transfer of payment obligation from one owner or tenant to another, however, may not be feasible in all situations. For example, if a restaurant closes and a dry cleaner opens in the same location, the measures installed for the restaurant may not be useful for the dry cleaner. A stipulation that allows for the remaining balance on the loan to be paid off at the time of ownership transfer may be useful in this case.
6. Tariff-based systems offer an opportunity to remove financing barriers for municipal governments. The New Hampshire pilots have demonstrated that PAYS[®] may offer a promising avenue for helping municipal governments to access capital without taking on new debt or engaging in costly multi-year equipment leases.⁴⁴ On-bill loan programs, on the other hand, may not be accessible to government entities because state laws may prohibit them from taking on multi-year debt.
7. Advocates in Vermont and New York have expressed concern that the utility commission did not have the authority to allow utilities to disconnect a customer's service for non-payment of the tariff.⁴⁵ Consumer advocates in Kansas objected to the disconnection component of the tariff in that state as well, although the Kansas commission ruled that the disconnection component

could remain in the tariff.⁴⁶ Some utilities have also expressed concern that they do not want their energy efficiency program to be responsible for disconnecting a consumer who is in default. Although disconnection provisions are not necessarily a requirement for tariff-based systems, such provisions do provide an additional level of security that customers will indeed pay the tariff to cover charges for the energy efficiency measures installed on their premises.

Ideal Applications for On-Bill Financing Programs

Municipal customers that need voter or board approvals to take on debt would find tariff-based systems especially attractive, as these systems do not necessarily involve taking on a debt obligation (unlike

on-bill loans). Also, although the tariff-based system works for all residential customer classes, it may be particularly useful for lower-income customers who may have a limited ability to take on debt.

Unlike the tariff-based systems, on-bill loans do not necessarily require the utility to seek regulatory approval of an energy efficiency tariff, so they are typically easier for the utilities to adopt. The customers who take advantage of the program must typically be able to take on debt, however, which can be a limiting factor for lower-income households and many government customers. Also, on-bill loans in the residential sector may fall under small consumer finance laws and regulations, subjecting the utility to fees, reporting requirements and other regulations particular to this type of financing, which could make on-bill loan programs less attractive to utilities.

States to Watch

New Hampshire has had the greatest experience with the tariff-based systems. Other tariff-based systems are being, or have recently been, established in *Hawaii* and *Kansas* and may soon produce data on their effectiveness. Michigan has adopted legislation that may result in an on-bill tariff program.

On-bill financing programs have been operating in *Connecticut*, *Massachusetts* and *Rhode Island* for almost two decades and have recently been adopted in *California*. These programs continue to be refined, with changes to the balance between rebates and loans, loan terms and program design features.

Further Resources on On-Bill Financing and Tariff-Based Systems

“Process Evaluation of the Pay As You Save (PAYS) Energy Efficiency Program as Delivered by New Hampshire Electric Cooperative and Public Service Company of New Hampshire,” GDS Associates, December 2003.

The PAYS® program has a website: www.paysmerica.org. This website contains numerous filings and data from PAYS® programs and proposals.

“Compendium of Champions: Chronicling Exemplary Energy Efficiency Programs from Across the U.S.,” Dan York, Marty Kushler, Patti Witte, American Council for an Energy-Efficient Economy, 2008.

Endnotes

1. Energy service companies (ESCOs) can also participate in these programs in lieu of the customers. ESCOs typically provide energy audit, financing and installation services to large customers (most frequently in government facilities) through a turnkey program. ESCOs install all energy efficiency equipment at no up-front cost to the customer, and earn their payback by taking a share of the customer's guaranteed energy savings over a period of several years.
2. Dennis O'Connor, United Illuminating, personal communication, June 2008 and Nancy Goddard, PacifiCorp and Paul Cillo, Energy Efficiency Institute, June 2008.
3. At the time that one customer vacates its premises and another moves in, the seller and buyer may also be able to negotiate for the seller to pay off any remaining balance. This might increase the risk of repayment as energy savings are not transferred to the customers' new home, resulting in shorter financing terms as discussed in this paper.
4. Nancy Goddard, personal communication, PacificCorp, June 2008.
5. Paul Cillo, consultant to PAYS America, Personal communication, March 2008. This tariff-based system is a trademarked program overseen by PAYS[®] America, a 501c3 non-profit institution. Information available at www.paysamerica.org.
6. "Process Evaluation of the Pay As You Save (PAYS) Energy Efficiency Program as Delivered by New Hampshire Electric Cooperative and Public Service Company of New Hampshire," GDS Associates, December 2003. Also based on personal communication, Harlan Locklan and Paul Cillo, originators of the PAYS[®] concept and consultants on PAYS[®] February 2008.
7. Frank Spasaro and Nancy Goddard, personal communication. Lending laws in California are much more stringent in the residential/consumer sector than they are in the business sector. As a result, the Sempra program elected to avoid an on-bill finance program for the residential sector. (Spasaro, personal communication).
8. Paul Cillo, personal communication, February 2008.
9. "Qualifications and Direct Testimony of Thomas S. Stanton, Michigan Public Service Commission," in the matter of the application of Consumers Energy Company for authority to increase its rates and generate and distribute electricity and for other relief. Case NO. U-14347. Michigan Public Service Commission, June 3, 2005. Also: Paul Cillo, personal communication, February 2008; Nancy Goddard, PacificCorp, June 2008; and personal communication, Frank Spasaro, Sempra Utilities, June 2008.
10. Chris Romer, personal communication, JP Morgan, February 2008.

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11. Dennis O'Connor, United Illuminating, personal communication, June 2008.
 12. "Financing Energy Efficiency Retrofits: No Money Down Programs that Use Utility Bills to Pay Back the Cost of the Retrofit through Energy Savings," DRAFT
 13. "National Action Plan for Energy Efficiency: Aligning Utility Incentives with Investment in Energy Efficiency," prepared by Val R. Jensen, ICF International, 2007. www.epa.gov/eeactionplan.
 14. "Chartwell's Best Practices Newsletter," Vol. 9 No. 6, June, 2007.
 15. Dennis O'Connor, United Illuminating, personal communication, June 2008.
 16. "Opening the Door to Small Business Energy Efficiency," Presentation to Charwell conference, Dennis O'Connor, United Illuminating Company, May 8, 2008.
 17. "Compendium of Champions: Chronicling Exemplary Energy Efficiency Programs from Across the U.S.," Dan York, Marty Kushler, Patti Witte, American Council for an Energy-Efficient Economy, 2008.
 18. "Compendium of Champions: Chronicling Exemplary Energy Efficiency Programs from Across the U.S.," Dan York, Marty Kushler, Patti Witte, American Council for an Energy-Efficient Economy, 2008.
 19. Dennis O'Connor, personal communication.
 20. *ibid.*
 21. The company elected to allocate partial payments to each relevant area based on the amount due for energy, on-bill finance etc.
 22. Frank Spasaro, Sempra Utilities, personal communication, July, 2008.
 23. *ibid.*
 24. *ibid.*
 25. Frank Spasaro, Sempra Utilities, personal communication, June 2008.
 26. "PacificCorp Large Commercial Energy FinAnswer," Profile #46, [The Results Center](http://www.ecomotion.us/results/pdfs/46es.pdf), 1993. www.ecomotion.us/results/pdfs/46es.pdf.
 27. Nancy Goddard, PacifiCorp, personal communication, June 2008.

28. The on-bill finance component of the Energy FinAnswers program is still available in Wyoming in PacifiCorp's Rocky Mountain Power territory, but according to PacifiCorp staff, the on-bill financing component is not being used at all (Nancy Goddard, personal communication).
29. *Ibid.*
30. "Process Evaluation of the Pay As You Save (PAYS) Energy Efficiency Program As Delivered by New Hampshire Electric Cooperative and Public Service Company of New Hampshire," GDS Associates, December 2003.
31. "Energy Efficiency Pilot Program Approved," Midwest Energy Inc., September 6, 2007. <http://www.mwen-energy.com/news.aspx?id=59>.
32. Update to Progress Report submitted to Surdna Foundation, January 2008.
33. Harlan Lachman, personal communication, February 2008.
34. Decision and Order No. 23531
35. Progress report submitted to the Surdna Foundation by PAYS America, December 11, 2007. Also Harlan Lachman, personal communication, February 2007.
36. NY PSC Case 07-M-0548 available at http://www.dps.state.ny.us/Case_07-M-0548.htm. A report about on-bill financing programs submitted to the Commission is available at http://www.dps.state.ny.us/07M0548/workgroups/WGVI-On_Bill_Financing_Final_Report.pdf.
37. GDS Associates, Process Evaluation of the Pilot "Pay As You Save Energy Efficiency Program, Delivered by New Hampshire Electric Cooperative and Public Service Company of New Hampshire," December 2003. Other states, such as Hawaii, have begun tariff-based systems but have not conducted evaluations of those systems, in part because they are still quite new.
38. GDS Associates, Inc. December 2003.
39. *ibid.*
40. For definitions of these policies, see the two-page policy definition at the beginning of this document.
41. Denis O'Conner, United Illuminating Company, personal communication, June, 2008.
42. Nancy Goddard, personal communication, June, 2008.

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43. Dennis O'Connor, personal communication, July 2008.
 44. GDS Associates, December 2003.
 45. Progress Report submitted to the Surdna Foundation by PAYS America, December 2007.
 46. Update to Progress Report submitted to Surdna Foundation, January 2008.

About the Alliance to Save Energy

The Alliance to Save Energy is a coalition of prominent business, government, environmental and consumer leaders who promote the efficient and clean use of energy worldwide to benefit consumers, the environment, the economy and national security. The Alliance advances energy efficiency policies, conducts research on various energy-related topics, and increases awareness and knowledge about the many ways that energy consumption can be reduced in the United States and throughout the world. For more information about the Alliance and its activities, please visit www.ase.org.

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