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Executive Summary

Energy efficiency benefits the economy, consumers and the environment. Consumers who install energy efficiency measures in their homes and buildings lower their energy costs and, potentially, the energy costs for all consumers on the power grid. In addition to net savings that accrue for businesses, consumers and states that implement energy efficiency programs and measures, energy efficiency policies have multiple environmental, energy and economic benefits:

The environment — Using less energy reduces the environmental effects of extraction, transportation, processing and combustion of fuels.

Public health — Efficient use of energy can lead to fewer potentially harmful environmental emissions, which may reduce negative public health effects.

Reliability of the energy system — Energy efficiency can lessen strain on the power grid. Enhanced security — Reducing grid congestion enhances grid flexibility and improves *resiliency* of the power grid during the loss of a power plant or power line.

Energy independence — energy efficiency represents an "in-state resource" that keeps investment dollars close to home.

State government agency finances — Energy saved is energy for which the state does not have to pay. States are saving millions of dollars by investing in energy efficiency.

This paper addresses a range of financing options for states to consider when developing an energy efficiency program. It includes a review of each financing mechanism, the barriers to implementation, benefits, and the states that are using the measure.

Introduction

Some states are considering energy efficiency as a resource planning tool—assessing the opportunities for energy efficiency in conjunction with planning for new power plants or transmission lines. Energy efficiency can save energy when it matters most—at times of peak demand. With these energy savings, as the energy efficiency industry grows, the potential exists for job creation.[1]

California's dedication to energy efficiency since the early 1970s has provided significant benefits, saving both energy and money. Since 1975, energy efficiency building and appliance standards and utility efficiency programs saved 10,000 megawatts of power, the equivalent of 20 power plants.[2] Since the introduction of these programs through 1995, efficiency and conservation programs reduced private and public sector electricity bills by $15.8 billion.[3] In times of rising energy prices across the country, this substantial opportunity for savings is notable. Other states such as Oregon, New Jersey, New York, Vermont and Wisconsin have similarly experienced favorable results.

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[1] Howard Geller, John DeCicco and Skip Laitner, *America's Energy Choices* (Washington, D.C.:ACEEE, 1992).
[2] Energy Foundation, Energy Efficiency and Renewable Energy-Faster, Cleaner, Cheaper (San Francisco, Calif.: EF, 2005).
[3] California Energy Commission, *California – Discover Its Energy* (Sacramento, Calif.: CEC, 2005).

Implementing energy efficiency projects has many benefits; however, there is one major barrier. Buying energy efficient products often means paying more for them up front, even though they save money for years to come, and even though the savings typically far outweigh their higher initial costs. This financial barrier makes it difficult for some companies and many governments to buy energy efficient products; internal policies and some laws require them to buy at least cost for the initial purchase. Because energy efficiency projects reduce the utility operating budgets, ignoring or postponing these projects means that the "energy waste" will continue to be paid to the utilities without receiving any of the benefits attributed to energy efficiencies. Often the dollars associated with "energy waste" can be used to pay for the financing of the improvements needed to generate the savings. A reexamination of these policies will enable states to consider other options that provide greater support for energy efficiency.

In many states, the designated energy office will administer residential, commercial and/or industrial energy efficiency programs (see appendix A). The state legislature, governor, public utility commission or utility likely will activate the program and may define its provisions.

Governments can invest in two key areas to achieve the greatest possible savings from energy efficiency. These include: 1) educating consumers about the benefits of energy efficiency and the availability and maintenance of energy efficient products, and 2) offsetting the cost of purchasing the equipment through energy efficiency financing.

Increasing Awareness and Educating Consumers

To develop widespread public understanding of the value of energy efficiency, education and personnel training are necessary. The ENERGY STAR program of the U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency (EPA) is a well-regarded example of how to bring to the general public awareness of energy efficient appliances and building materials. ENERGY STAR certifies more than 40 kinds of energy-efficient items—as well as services and buildings themselves—with an increasingly familiar label. DOE and EPA report that 60 percent of the public is now familiar with the label.[4] All efficiency activities for products and buildings supported by ENERGY STAR save approximately $7 billion per year.[5] In 2005, ENERGY STAR users saved about $12 billion on utility bills.[6]

For energy efficiency to succeed in the residential and commercial sectors, facility managers and others who regularly use and maintain appliances and buildings require education and a commitment to efficiency. Training is important because many energy efficiency technologies for buildings require proper maintenance to reach their full potential.

Legislatures can help encourage energy efficiency by providing resources to educate and train those who most often use the equipment—superintendents and facility managers. A highly efficient refrigerator, for instance, can lead to 40 percent annual reductions in energy costs compared to a standard model. Like any other refrigerator, however, it operates most efficiently if the condenser coils are cleaned regularly. If monitored correctly, building energy

[4] U.S. Environmental Protection Agency, *ENERGY STAR 2004 Annual Report.* **http://www.energystar.gov/ia/news/downloads/annual_report2004.pdf**, September 2005.
[5] Xcel Energy, *Saving Energy in Our Country.* http://www.xcelenergy.com/docs/corpcomm/engyclas/EC_CO_IN_GovIndSave.pdf, April 2004.
[6] U.S. Environmental Protection Agency, *Energy Star Overview of 2005 Achievements,* http://www.energystar.gov/ia/news/downloads/2005_achievements.pdf , March 2006.

management systems can save a great deal of energy. Many states have targeted energy efficiency incentives for use by public schools. Several of these states also allow districts to hire expert energy managers to monitor energy use, seek opportunities for more savings, periodically check on equipment, and make the most of incentive programs. Energy efficient appliances and building upgrades depend upon the cooperation and understanding by the people who use them.

Energy efficiency education also can target young people to help overcome a generally low level of awareness among consumers. Utilities such as Xcel Energy, Florida Power and Light, and San Diego Gas and Electric offer child-friendly information about energy issues—including conservation—on their websites or through curricular materials for teachers. National Energy Education Development (NEED) and the Kansas Energy Education Foundation are nonprofit organizations that focus on increasing energy efficiency by delivering educational programs. The Energy Hog advertising campaign, sponsored by the Ad Council, seeks to teach young people and their parents how to save energy at home. DOE offers several education programs, including EnergySmart Schools, which aims to reduce school energy consumption and also teach students about efficiency and conservation. State governments also are becoming involved by supporting NEED programs or designing their own education efforts. Watt Watchers of Texas is teaches students about efficiency while they locate energy-saving opportunities in their own schools. This program is supported in part by the state's Energy Conservation Office and Comptroller of Public Accounts. Connecticut's Energy Efficiency Fund supports EESmarts[7], an energy efficiency learning experience. This program offers grade-specific curriculums (kindergarten-grade 8) that teaches students important energy concepts and then empowers them to make important decisions about energy use in their daily lives. The program is free to specific utilities and also includes teacher training.

Other barriers to implementing energy efficiency programs may exist, depending on the type of financing mechanism used. Some of the additional barriers—such as legal or regulatory—are discussed in the sections on the various financing methods. This paper focuses mainly on how states might finance energy efficiency programs.

[7] See EESmarts at eesmarts.com for more information.

Energy Efficiency Financing: Specific Measures

Energy efficiency financing is a vehicle for addressing the increased capital cost of efficient equipment. Often, these financing costs can be paid from the savings realized in the annual utility budgets. Policymakers can select from several financing mechanisms to facilitate and encourage widespread use of energy efficient products and practices. Many modes of energy efficiency financing exist across a variety of sectors. These include state governments, banks, utilities, energy service companies and energy consumers. State governments offer grants, loans, tax incentives and bond issuances or authorize other methods to encourage investment by consumers or companies. Banks offer funds for loans. Utilities offer incentive programs for reducing energy demand. Energy service companies offer contracts whereby the company loans money for the capital cost and guarantees energy savings over time. Consumers purchase products and services that improve efficiency.

The major types of energy efficiency financing described below—performance contracting, tax-exempt lease purchase agreements, *utility demand side management, tax incentives, system benefit funds, capital bonding, loans, grants and Pay As You Save (PAYS ®)—have been* authorized in a variety of states and have unique characteristics.

Performance Contracting

Performance contracting uses future energy savings to repay the cost of efficient equipment, meaning that capital is not required upfront. Examples of projects that performance contracting could finance include replacement of boilers, lighting, chillers, windows, insulation and fans. This financing method also is used to finance computerized building energy management control systems, which track and control energy use throughout a building. An energy service company (or energy management company) initially purchases, installs and operates the product and guarantees the customer a certain amount of energy savings. Usually, the savings are guaranteed to meet or exceed the annual payments that the customer must make for the equipment over the contract period. This energy service company can arrange financing in various ways, including a bank loan, utility financing, or a lease-purchase agreement (described in detail later in this report), or the customer can use internal funds or bond proceeds. The energy service company may earn its money by sharing a portion of the customer's energy savings.

State authorization—usually in the form of legislation—is necessary to enable public entities such as state agencies or school districts to engage in performance contracting. Every state but Wyoming has enacted legislation to authorize performance contracting for at least one of the following: school districts, municipalities, state colleges and universities, counties, and state government buildings.

Barriers to performance contracting include legal concerns such as bans on government entering multi-year contracts, limits on the debt they can incur, and concerns about liability. Other barriers arise from a need for more education about performance contracts and understanding of its long-term benefits. Performance contracting is most commonly used as a long-term energy saving strategy for large, older facilities that use a significant amount of energy. Projects also require commitment; after installation of efficient equipment, energy service companies must monitor energy use and maintain equipment to verify that savings accrue.

Performance Contracting

This financing method is a good fit for buildings that:

- Are larger than 40,000 square feet;
- Generate energy bills of more than $40,000 per year;
- Are aging or have aging equipment that is ready for replacement;
- Have recurring maintenance problems or high maintenance costs;
- Cause complaints among building occupants about heating, ventilation, air conditioning or lighting;
- Have scarce budget resources; and
- Are maintained by staff who are already too busy or lack energy expertise.

Source: Energy Services Coalition, 2005.

Kansas

To provide public agencies with a convenient source of construction financing, a Kansas statute created the Facility Construction Improvement Program (FCIP). This program makes it easy for agencies to coordinate with energy service companies. As in other states, the Kansas law requires that the contractor guarantee that the savings over the life of an energy efficient project will repay the initial investment. The contractor also is required to choose equipment based on the expected cost of operating over the equipment's lifetime, rather than on its initial purchase price.

Energy Performance Contracting for Kansas State University

Project Size: 76 buildings, 4.8 million square feet
Project Value: $19.3 million
Source of Funds: State Bonds Program
Contract Terms: 17.5 years
Project Schedule:

Project Phase	Project Dates	
	Started	Completed
Comprehensive Energy Analysis	March 2002	November 2002
Design/Implementation	August 2003	August 2005
Monitoring	September 2005	August 2022

Guaranteed Annual Energy Savings: Year One: $1.497 million (escalated by 1 percent per year)
Annual Non-Energy Savings: Year One: $133,000 for operations and maintenance (escalated by 1 percent per year)
Achieved Savings: Not yet available

Source: Kansas Corporation Commission, 2005.

The FCIP program provides a potential customer with two audits—a preliminary audit and an investment grade audit—to determine current energy use and the best opportunities for energy savings. If the contractor and customer agree on projects to be undertaken, they execute a contract based on standard FCIP contract language. One project financed through FCIP is an energy upgrade at Kansas State University. The contract funded boiler, chiller and lighting renovations; new windows; pipe insulation; water conservation; and a comprehensive utility monitoring system. Figure 1 shows details of the project.

Tax-Exempt Lease Purchase Agreements

A tax-exempt lease purchase agreement—also known as a municipal lease—is one of the most attractive financing options for state governments because it offsets the initial costs of purchasing and implementing energy efficiency measures and may effectively link its repayment to annual operating budget savings. This option allows future energy savings to finance efficiency improvements today and spread capital costs over the lifetime of the efficiency equipment. Under the lease-purchase agreement, the lessee (borrower) pays monthly installments toward the cost of the efficiency improvement project (including interest). At the end of the contract term—that often ranges from five to 10 years, or to 15 years for large projects—the lessee will own the equipment. A tax-exempt lease-purchase agreement generally includes "non-appropriation language" that ties the lessee's payment obligation to the current operating budget and makes future payments contingent upon the future appropriation of funds for the particular project. Because of this ability to terminate the agreement, many states do not consider this to be a debt instrument. If the state government does not appropriate funds for the lessee to make its installment payments, the lessee returns the equipment and the lender terminates the repayment obligation.

One benefit of a tax-exempt lease purchase agreement is that the interest rate earned by the lender is not subject to federal taxes. The lender can pass through this benefit by offering lower interest rates than for comparable commercial transactions. In addition, the lease and lease payments may be considered operating costs, not debt. Commercial leasing companies, management and financing companies, banks, investment brokers, or equipment manufacturers offer these agreements. Another benefit is that this type of financing may not require legislation or voter referendums because it is not considered "debt". This type of energy efficiency project may simply fit into an already existing master leasing agreement.

Only tax-exempt entities—such as cities, counties, school districts, police departments, fire departments, state universities, community colleges, municipal hospitals and most other government agencies—qualify for tax-exempt lease purchase agreements. Illinois, New Hampshire, New York, Maryland, Minnesota, Mississippi, Pennsylvania, Texas and Virginia have programs using tax-exempt lease purchase agreements.

The state agency responsible for state government facilities or the state energy office often facilitates tax-exempt lease purchase agreements. The agency may issue a request for proposal to lenders, after estimating the necessary financing for anticipated building upgrades for the next few years. The agency selects a financing provider and negotiates a contract, then designs a process for state facilities to acquire financing. The agency may consider setting up a special utility budget account to which lessees make payments. Public entities enter into an agreement and implement energy efficiency measures using future energy savings from operating budgets.

A word of caution: some state statutes or charters may treat lease purchase agreements as debt. Naturally, financing may not be necessary if other funds are readily available or excess money is available in capital or operating budgets.

New Hampshire

In 1997, the New Hampshire legislature passed a performance contracting statute creating the Building Energy Conservation Initiative (BECI). In May 2002, the state treasurer secured financing for BECI, which enabled the state to begin new energy efficiency projects. The master lease program (MLP) payments become a line item in the participating agency's utility budgets. As utility costs decrease after the efficiency improvements are made, savings fund the MLP payment line item and excess savings go to a state general fund. Allowable improvements under the performance contracting statute include lighting upgrades; heating; ventilation and air conditioning (HVAC) upgrades; domestic hot water systems; energy management controls; water conservation measures; building envelope improvements; and miscellaneous projects approved by the energy service company.

The master lease offered the best financing option for New Hampshire. Under the lease program, the state borrows only the amount necessary for each performance contract, rather than using one bond to cover multiple projects and paying interest on the entire amount. With the master lease, the state draws from the account to finance each project, and the money is kept in escrow to earn interest during construction.

Utility Demand Side Management

Utility demand side management (DSM) refers to activities that utilities may undertake to reduce or modify customer demand for electricity. Although it is not specifically a financing mechanism, demand side management is allied with (not equivalent to) energy efficiency and sometimes includes financing methods such as grants and rebates. DSM programs can reduce overall electricity demand through conservation and efficiency or can shift some demand for power to off-peak times of day when overall demand on the system is lower. Before the advent of electric industry restructuring, utilities commonly implemented their own DSM programs. Regulation required them to consider the benefits of increasing energy efficiency as an alternative to building more electric generation, transmission or distribution systems. These DSM programs still exist in many states that have not restructured their electric power industries. Utilities can choose to offer DSM in restructured states, however, and some restructured states reestablished DSM programs after restructuring occurred.

Utilities spent approximately $28 billion on DSM programs between 1990 and 2004. In one example, Xcel Energy's Custom Efficiency Program provided the Office of Environmental Affairs in Boulder, Colo., with rebates to install energy efficient equipment—such as efficient lighting and HVAC upgrades—to reduce summer peak electric demand. More than 35 businesses in the city received the equipment rebates, totaling more than $187,000, and are expected to save about $160,000 per year.[8]

Another example of utility DSM programs is load management, which encourages customers to carry out highly energy-consuming activities in the early morning or evening. Load management programs take stress off the power grid at the peak usage hours. However, load

[8]Carolyn Weinreich, Maximizing Utility DSM Resources for Boulders Commercial Energy Efficiency Program (Boulder, Colo.: Office of Environmental Affairs, 2005).

management programs may not reduce overall consumption, and depending upon the emissions profile of the load, may have varying environmental impacts.

Load management programs often operate in conjunction with time-of-use pricing or real-time pricing, in which the utility keeps track of the times of day when a customer uses electricity. This usually is accomplished by using a special meter that displays the price of power at that time, rather than the typical rate averaged over time. Either pricing method requires customers to pay a rate that, to some degree, reflects the actual higher cost of power at peak times. If a customer knows that the cost of power to run the dryer is lower at 9:00 pm than at 4:00 pm, the customer can choose the later time and save money. It also is beneficial to the power system to shift some demand from peak time to off-peak time, when there is a greater supply of power on the grid and the transmission system may be less congested.

A significant barrier to energy efficiency is the throughput incentive, which bases a utility's revenue stream on the amount of power it sells. Energy efficiency measures reduce "throughput" of power. Under some rate structures, efficiency investments cause a loss of profit that is much greater than a simple loss of revenue. In some cases, a vertically integrated utility that loses 1 percent in power sales suffers a 5 percent reduction in profit. A distribution company could experience greater losses—11 percent profit reduction for every 1 percent drop in sales. Several options exist to help overcome this barrier. One is to remove or "decouple" the link between a utility's profits and the amount of energy it sells through the use of performance-based ratemaking. This rate structure rewards utilities financially for improving efficiency and lowers ***the bills of customers who save energy or use it during off-peak times.*** California and Oregon have decoupled electric and/or natural gas sales volume from revenues. North Carolina and Utah have decoupled rates for at least one natural gas utility.

Another method is to allow lost base revenue adjustments, where commissions allow utilities to adjust rates to recover the revenues lost through reduced sales. States also could choose to connect the amount of recoverable revenue to energy efficiency goals. If the utility meets its efficiency goals, it is permitted to recover those funds by adjusting rates. In general, revenues lost from efficiency measures usually are less than the cost of the measures themselves. States that have enacted lost revenue adjustments include Indiana, Massachusetts, Ohio and Rhode Island.

Minnesota

States may need to cap the amount that utilities can recover. In Minnesota, lack of a cap on lost revenue recovery led to high costs. The state replaced its lost revenue adjustment with a shared savings plan, allowing utilities to share in the savings from efficiency.[9] This shared savings approach is the final area in which states can help overcome the throughput incentive and offer utilities an incentive to increase efficiency.

California

In California, to promote energy conservation and efficiency, the state's Energy Action Plan requires that utilities implement a "loading order" to solicit energy resources. Utilities must first consider energy conservation, then resource efficiency, then reducing per capita electricity demand. Overall, the loading order favors renewables over fossil-fueled resources on the supply side. Other states are examining the loading order option as well.

[9] Regulatory Assistance Project Issuesletter, September 2005 and Keystone Center Report "Decoupling and Other Mechanisms to Address Utility Disincentives for Implementing Energy Efficiency", May 19, 2005, http://www.keystone.org/Background_Decoupling_5-19-05_PQA_final.doc

Tax Incentives

Many states offer tax incentives[10] on energy efficiency equipment that exempt, reduce or credit the tax on purchases of efficient equipment. Tax incentives lessen the upfront costs of energy efficient products, speed up market acceptance, and increase market share for energy efficient products and services.

Tax incentives normally are developed at the legislative level, with energy savings calculated by the state energy agency. They are based on the rationale that the state benefits from reduced demand for energy supplies and electricity infrastructure. Energy efficiency tax incentives include sales, corporate, income and property tax incentives.

Sales tax reductions or waivers generally reduce or remove the state sales tax from the cost or installation of energy efficient equipment or services. Connecticut and South Carolina offer such incentives.

Corporate incentives offer tax credits to corporations against the cost or installation of efficiency equipment, as in Maryland, Massachusetts, Montana, New York and Oregon.

Income or personal tax incentives allow taxpaying residents to cover a portion of the cost or installation of efficiency equipment or services with an income tax credit or a deduction (from their adjusted gross income). Arizona, California, Idaho, Maryland, Massachusetts, Montana, New York, Oklahoma, Oregon and the District of Columbia offer such incentives.

Property tax incentives range from local property exemptions to special, reduced, property assessment for value added by energy efficiency equipment. Maryland and Nevada offer such incentives.

Efficient appliance sales tax credits, which fall under the sales tax waiver or reduction category, are the easiest and least costly to implement. These credits are employed at the retail level and eligibility is product-specific, meaning some products are eligible for credit and some are not. This type of incentive can be based on specific state guidelines or on the federal Energy Star appliance standards. States have based tax incentives on the federal ENERGY STAR appliance specifications or on more stringent state guidelines (e.g., Oregon).

Green building tax credits are a type of property tax incentive. These credits give building owners a tax credit if their new building meets certain energy efficiency and environmental standards. This incentive requires the state to set regulations or to use an accepted scoring system for building standards, such as the Leadership in Energy and Environmental Design (LEED) or International Energy Conservation Code (IECC). ENERGY STAR Existing Homes and New Homes programs also serve as standard to certify green buildings. Green buildings tax credits and appliance credits are among the most popular tax incentives.

The federal Energy Policy Act (EPAct) of 2005, signed by the president in August, offers homeowners a range of tax credits for the purchase and installment of efficient products, such as windows, doors, insulation, and heating and cooling equipment. Businesses also are eligible under EPAct for tax credits for building efficient buildings.

[10] See the *State Clean Energy-Environment Technical Forum-Documents* online at http://www.keystone.org/html/documents.html#tax for more information.

New York

States have developed various tax incentive programs. In May 2000, the New York Legislature passed the Green Buildings Tax Credit Initiative; the standards became effective in 2002. The initiative provides for tax credits to owners and tenants of eligible buildings that meet specific standards intended to increase efficiency, improve air quality, and reduce the environmental impacts of commercial and residential buildings in the state. The allowable amount of credits issued is $25 million. Maryland implemented a similar program in 2001.

With tax incentives, states may face potential budget implications due to the loss of tax revenue. For example, sales and tax incentives may affect the state budget, while property tax incentives could affect local government revenue.

Oregon

In Oregon, homeowners receive an income tax credit for construction of energy efficient homes or installation of energy efficient appliances. The tax credit cannot be more than 25 percent of the appliance cost, and the cap is $1,000 per year for each homeowner. In addition, Oregon offers a Business Energy Tax Credit to those who invest in energy conservation, recycling, renewable energy resources and less-polluting transportation fuels. The tax credit is 35 percent of the eligible project costs, is paid over 5 years, and can be discounted and "passed through" to partners. This allows a public entity or nonprofit organization with no tax liability or a business with tax liability to benefit from this program.

Connecticut

Connecticut implemented a continuous 100 percent sales tax credit on weatherization products and services—including equipment insulation; programmable thermostats; caulking/weather-stripping; duct/air sealing; building insulation; and water heaters, furnaces and windows that meet the ENERGY STAR requirements—for customers eligible for energy assistance from November 25, 2005, to April 1, 2006. This effort was intended to increase the number of weatherized households in the state.

Major lessons learned in states with energy efficient tax incentives include the following:

- To maximize the benefit of the tax credits, a complimentary marketing or public information program should supplement the tax credits.
- It is important to consider the program funding level.
- Evaluate the program to measure success.
- Define the duration of the incentive.
- Examine complementary policy initiatives and appropriate credit amounts.
- Funding caps are useful to avoid excess state revenue loss.

System Benefit Funds

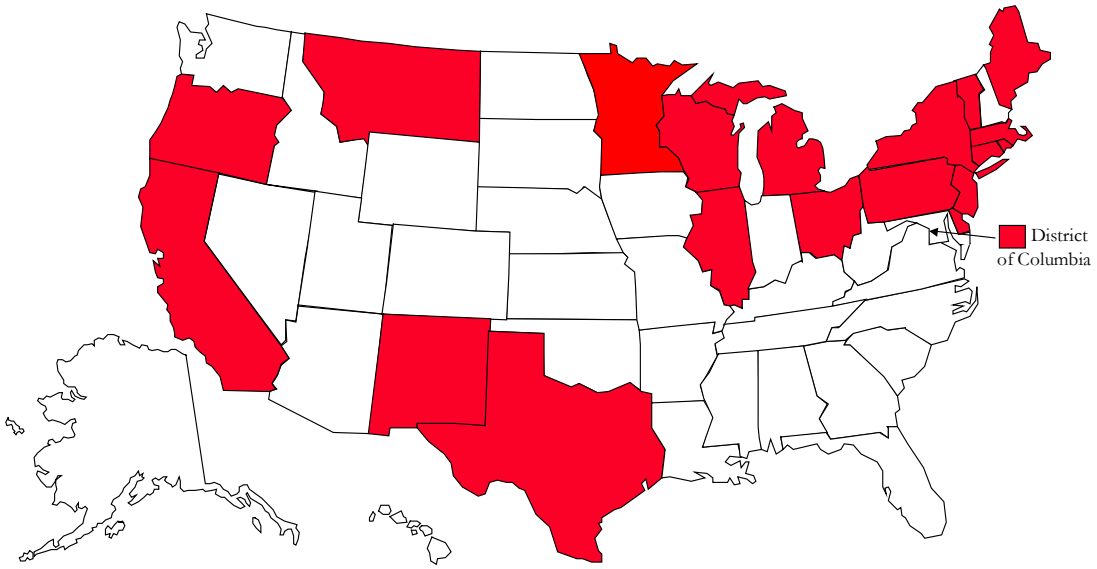
System benefit funds also are known as public benefit funds, clean energy funds and system benefits charges. A minor charge collected on a customer's utility bill each month finances the fund that, in turn, supports efficiency programs, low-income weatherization assistance,

renewable energy programs, energy education, and research and development activities. The charge might be a flat monthly rate or be based on usage (per kilowatt-hour). Charges range from 0.03 to 3 mills per kilowatt hour (kWh) and are equivalent to about $0.27 to $2.50 on a residential customer's monthly energy bill.[11] Instead of a customer charge, some states collect funds through specified contributions from utilities ranging from one percent to three percent of utility revenues.

States may consider creating a new agency or using an existing agency (usually the agency that manages state efficiency programs) to operate and disburse the funds. In some cases, state energy offices or utilities manage the fund and, in some states—Maine, Oregon and Vermont—a nonprofit organization manages the fund under a contract with the state.

Public benefits funds for energy efficiency are in use in 18 states and the District of Columbia (see figure 2). System benefit funds are operating in both regulated and deregulated electric markets. States with deregulated electricity markets find that system benefit funds ensure adequate funding for efficiency projects in a competitive market because, in a competitive market, utilities that are attempting to provide the lowest cost energy for customers may be less likely to support efficiency projects. States create system benefit funds in legislation and, in some cases, by regulation.

Figure 2. States with Public Benefits Funds for Energy Efficiency



Source: NCSL, April 2006

Policy points of note are that a system benefits charge should be competitively neutral and non-bypassable. This means that each utility is required to include the system benefit charge on customer bills and all customers pay the charge. During recent budget shortfalls, a few states

[11] U.S. Environmental Protection Agency, *Clean Energy-Environment Guide to Action* (Washington, D.C.: U.S. EPA, 2006).

used their system benefit fund money to help close state budget gaps or to support non-energy efficiency purposes. Policymakers may want to consider how to isolate the fund from use for non-energy efficiency purposes so that the charge, in effect, does not become a "hidden tax" increase collected by utilities. Vermont and the District of Columbia used legislative language to protect their funds from this occurrence. Vermont prohibits the funds from being made available for "general obligations of the government" and disallows them from being included in state financial reports. In D.C., the language reads that funds should not be "transferred to, lapse into, or be commingled with the General Fund of D.C. or any account of D.C."

It may be difficult in a time of increasing energy bills, for the legislature to justify an additional charge on utility bills for a system benefits fund. A system benefit fund also adds administrative responsibility to the new or existing agency that is charged with managing the fund; however, those responsibilities can be offset with a small percentage of revenues from the fund.

New Jersey

In 1999, New Jersey restructured its electric system with the Electric Discount and Energy Competition Act (EDECA). The bill established a system benefits charge on gas and electric customers to implement the New Jersey Clean Energy Program. For the first five years, 75 percent of the funding went to energy efficiency programs, and the remaining 25 percent went to renewable energy programs. The percentages have since shifted, and a greater percentage now goes to renewable energy programs.

In 2002, program administration shifted from the utilities to the Office of Clean Energy within the Board of Public Utilities (BPU). In 2004, the BPU approved a total funding level of $745 million for 2005 through 2008 for its energy efficiency and renewable energy initiatives, an increase of more than $250 million above the funding levels approved for the first four years of the program.

New Jersey realized increased electricity savings in each year since the program was initiated in 2001. In 2004, the nationally recognized program helped build 5,974 new homes certified to New Jersey Energy Star Home standards (representing more than 16 percent of all new homes built in the state) and sold or distributed almost 2 million high-efficiency lights and fixtures. Two other successful initiatives include 1) the Comfort Partners low-income energy assistance program, which served more than 6,500 families in 2004 by installing energy efficiency measures in homes at no cost; and 2) the Combined Heat and Power Initiative that installed on-site generation using waste heat to improve efficiency. More than $4 million was committed for 24 projects in 2005 for this effort.

Capital Bonding

A government bond is a debt instrument issued for a period greater than one year for raising capital. Energy efficiency projects financed with bonds often use the energy savings from the project to cover financing costs. The low interest rates of state government-issued bonds make them attractive. Generally, a bond is more appropriate for large-scale efficiency projects or a grouping of several smaller projects where the payback is enough to cover the principal and interest payments associated with the bond.

Bond types include the following.

- General obligation bonds—The issuing government commits its assets and taxing powers to pay the debt. This type of bond usually faces a debt ceiling or a limit to the amount of debt. These bonds, which rely on a commitment of taxpayer funds to repay the principal

and interest, generally are the most marketable type of bond and are charged the lowest interest rate in a state with a favorable bond rating.

- Revenue bonds—Also called "limited obligation bonds," revenue bonds are legally tied to a dedicated repayment source and are not considered to be a general obligation of the issuer. There is no debt ceiling for revenue bonds.

- Bond banks—States create funding pools, or bond banks, to provide accessible funds or to purchase the debt of current local government bond issues. The debt ceiling applies in this case.

The interest rate for a bond is based upon several factors, including the tax and credit status of the borrower and the project cost and risk. Because bonds require significant administrative oversight, they can be more costly than other types of financing. Policymakers often set debt-limitation ceilings on bonds to prevent excessive debt. Limits also may be placed on the types of projects allowed under bonds because of the guaranteed repayment requirement.

Iowa

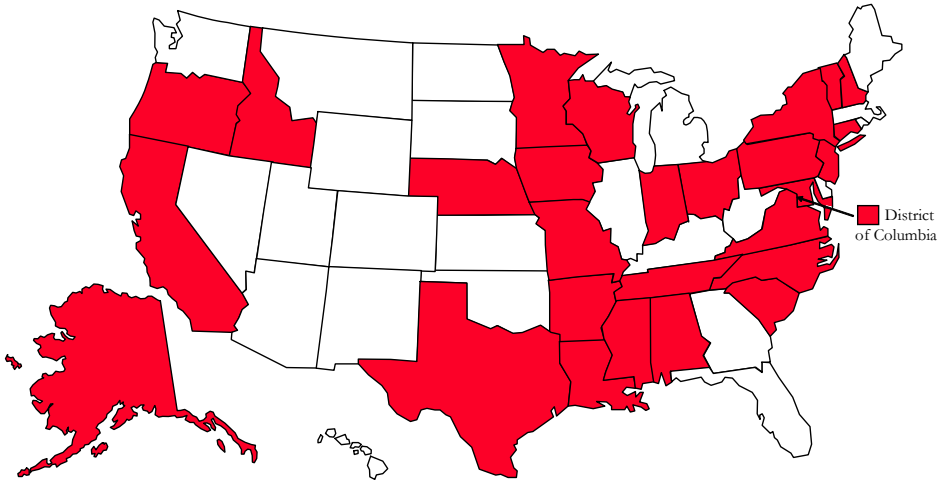
In 1986, Iowa incorporated the State of Iowa Facilities Improvement Corporation (SIFIC) as an Iowa nonprofit. Revenue bonds of more than $12 million were sold to help state facilities implement energy efficiency measures for state buildings. The energy office within the Department of Natural Resources administers the program. In 1999, the SIFIC paid off its original bond issue a year early with the energy savings, resulting in interest savings of $130,000. Since its inception, the SIFIC has supported installation of more than $49 million in efficiency improvements, resulting in more than $88 million in energy savings. State facilities, schools, hospitals, local governments, private schools and colleges, and other nonprofit organizations are eligible to participate.

Loans

Energy efficiency loan programs are another way states support energy efficiency measures. Loan programs are financed in several ways, including bonds, electric bill surcharges and oil overcharge funds.[12] The oil overcharge funds have been totally depleted in many states. Legislation may direct a certain amount from general appropriations or other funding pools for the program as well. State programs typically are able to offer lower interest rates by buying down lender loans. Payback periods, which usually range from seven to10 years, have low administrative costs. Revolving loan funds, used by many states, usually have a predetermined funding ceiling. Energy savings pay back the loan. State agencies normally administer the program after the legislature approves a funding level. States should be aware that private sector companies that offer efficiency loan programs may compete with state loan programs. These programs are used in 27 states (see figure 3).

[12] Oil overcharge funds consist of money that oil companies paid state governments after federal court settlements of alleged violations of oil price controls in the 1970s and early 1980s; the funds are rapidly decreasing.

Figure 3. States with Energy Efficiency Loan Programs



Source: NCSL, April 2006.

North Carolina

North Carolina's Energy Improvement Loan Program (EILP) is available to local governments, public schools and nonprofit organizations for projects with energy efficiency enhancements. A 3 percent interest rate is available on loans up to $500,000. Projects usually include HVAC, building envelope and lighting improvements. The North Carolina State Energy Office administers the loans, and as an incentive in 2005, the office offered to pay credit fees up to 1 percent of the value of the loans for the loan life. One requirement for project qualification is that savings from the efficiency measures must recover capital costs within 10 years, the maximum loan term.

Texas

In 1989, the Texas Legislature approved minimum funding of $95 million for a financing program called LoanSTAR (Saving Taxes And Resources). The program offers a 3 percent interest rate with a payback of 10 years. The State Energy Conservation Office (SECO) administers the loan. The procedure for state agencies, public schools, public hospitals, local governments, and municipalities eligible for the program is as follows:

Borrower signs a memorandum of understanding with SECO and requests technical guidelines. Borrower then prepares an energy assessment, the cost for which can be added to the loan request.

Borrower submits loan application and assessment to SECO; once approved, SECO and borrower execute loan with project specifications.

Once SECO approves specifications, borrower begins project. SECO performs on-site project monitoring. Borrower begins repayment of loan when project is complete.

Through December 2004, total savings for public agencies amounted to $152,410,130. The program ensures quality control through a number of measures such as energy assessment guidelines, training for energy engineers, protocols for project monitoring, and analysis of energy savings. LoanSTAR administrators credit the program's success to these quality control procedures.

Grants

Because they require no payback, grants are less expensive to administer than loans; thus, they are a preferred financing option for efficiency improvements. System benefit charges, federal funding, land use fees and oil overcharge funds often are sources of grant funds. The state energy, environmental or natural resource agency or public utility commission typically administers energy efficiency grants. States have awarded grants in the residential, commercial, utility, industrial, agricultural and public sectors. Grants fund energy efficiency research or commercialization of a technology.

Grant funding often is competitive. The state agency that manages the funding will offer a request for proposals. These proposals usually are required to meet certain requirements, such as a funding request limit or technology restriction, and may even specify only commercially available equipment. In addition, grants may include a requirement of a total or percentage-based funding match by the grantee to leverage the grant funding.

Energy efficiency grant programs are in place in Connecticut, Indiana, Illinois, Iowa, Kansas, Michigan, New Mexico, North Dakota, Ohio, Oregon, Pennsylvania and West Virginia.

Michigan

Michigan's Low-Income and Energy Efficiency Fund, administered by the Public Service Commission, offers grants to qualifying participants to promote energy efficiency. The Customer Choice and Electricity Reliability Act, passed by the Legislature in 2000, authorized the fund. Detroit Edison contributes to the fund and, by May 2005, had remitted more than $168 million. In 2004-2005, the Department of Labor and Economic Growth appropriations was authorized $55 million for the fund.

Of the three categories for funding, two relate to low-income assistance and weatherization and the third is for the development of energy efficiency programs that benefit all customer classes (25 percent of total funding). Grants in 2005 totaled $18.2 million for improvements to energy efficiency technologies and $27.7 million for low-income energy efficiency projects.

Pay-As-You-Save (PAYS®)

Through an innovative financing program called Pay As You Save® (PAYS®), building owners and tenants can purchase and install energy efficiency and renewable energy products with no up-front payment or debt commitment. A tariffed charge is included on utility bills for as long as the owner or tenant occupies the building. When occupancy ends, the charge passes to the next owner or tenant. All customers at a building with a PAYS® solar hot water heater will pay less than they would have without the installed equipment because the charge is structured to be less than the energy savings over the course of each year.

PAYS® works in both regulated and deregulated energy markets. A customer's electricity distribution company, energy supplier, a third party capital provider (e.g., a bank), or product

vendor provides the up-front capital to purchase the equipment. Whoever supplies the capital is repaid (including financing costs) through the customer's monthly payment of the PAYS® tariff, which is based on the useful life of the installed measure. The electricity distribution company collects the monthly payments and forwards them to the capital provider (unless the distribution company supplied the capital).

The energy-saving measure does not qualify as a PAYS® product unless the charge is equal to or less than 75 percent of the energy savings over 75 percent of the useful life of the equipment. For example, if a new solar hot water heater with a useful life of 16 years is installed in a building, the charge is spread across the building owner's or tenant's utility bill(s) for 12 years. The estimated energy savings from the installation will significantly exceed the charge on the utility bill. Initially, it is likely that states or utilities will establish or contract with a state agency, nonprofit organization or consulting business to certify PAYS® products and set (or approve) the maximum monthly payment amount.

Developed by the Energy Efficiency Institute's (www.eeivt.com) Paul Cillo and Harlan Lachman, PAYS® requires regulatory approval in most jurisdictions. In some cases, regulators may also desire legislative approval to authorize PAYS®. The tariffed charge is treated like any utility charge, meaning that non-payment by the customer results in disconnection, and a utility can recover any bad debt from PAYS® non-collections. From a state and utility perspective, the only costs of implementing PAYS® are for design and set up of the regulations and tariff. Once the PAYS® system is in place, it can also be used to enhance existing subsidy programs, making them more cost effective and able to reach more kinds of customers.
States can use any capital source to fund the equipment installations. For instance, the state can use a bond to finance the equipment, and the utility will repay the bond from the utility bill charges. Private capital is often the preferred way to institute the program because it does not require state funds. In this case, the utility would repay the private capital supplier. PAYS® currently is in use in New Hampshire and a program recently passed in the Hawaii legislature. Several other Northeastern states and Michigan are also considering the PAYS® system.

New Hampshire

In January 2002, New Hampshire implemented the first PAYS pilot program after a 2001 authorization from the public utility commission. New Hampshire's process differs from the private capital method of financing in that the utility used its own capital. The results of the program showed that customers who previously had not purchased energy efficient products would do so with the PAYS program; few customers defaulted on payment. Only one did not pay in the pilot program, representing less than 0.08 percent of the total amount customers spent on PAYS measures. Utilities had few complaints on billing and collection.
In one New Hampshire condominium, Forest Ridge in Lincoln, a new dehumidification system seemed financially improbable. With PAYS, the customer purchased an energy efficient dehumidification system. The customer now spends only $530 per month and saves more than $830 per month in reduced energy costs and more than $160 per month in reduced maintenance. The net savings for this owner is $460 per month.

Conclusion

Energy efficiency offers an array of benefits in many circumstances, but it also faces several important barriers. These barriers, mainly financial and informational, arise from frequently higher up-front cost and the public's lack of familiarity with the technologies.

States have explored ways to overcome these barriers through financing mechanisms, regulatory changes, and consumer and operator education. Traditional incentives such as loans, grants and tax exemptions can lead to greater market penetration, while innovative approaches such as performance contracting and Pay As You Save® offer flexible financing options that use energy efficiency's long-term savings to pay its initial cost. With a fair amount of unpredictability in fuel and electricity supply and prices and ever-increasing demand, states may design even more strategies for efficient energy use. Each state has an agency through which energy efficiency programs often are managed. Appendix A lists the directors of those offices who can be contacted for state-specific information.

States face a need to develop secure and affordable means of energy. Environmental provisions in many cases require the use of clean energy to meet that growing need. According to the U.S. Environmental Protection Agency, U.S. energy demand by 2025 is expected to increase by more than one-third; electricity demand is expected to rise by 40 percent. Energy efficiency measures reduce the demand for energy and have energy system, environmental quality, public health and economic co-benefits.

Energy efficiency is a key planning aspect that can help states deal with rising demand for energy, constrained resources and volatile energy prices. Eliminating the barrier of how to pay for energy efficiency measures or improvements is a critical step in implementing this beneficial tool.

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