

Tax Credits for Energy Efficiency and Green Buildings: Opportunities for State Action

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ABSTRACT

With volatile energy prices and continuing electric system reliability problems, states are increasingly looking for legislative actions they can take to encourage energy efficiency and thus address these problems. Tax incentives have proven to be an important strategy. Existing programs range from residential efficient appliance incentives to large-scale commercial "green" building incentives. Tax incentives of this nature are important tools for states to use to spur adoption of advanced building codes and appliance/equipment efficiency standards by decreasing the high first cost of new technologies and practices while increasing the market share of both. State programs have many advantages, compared to federal initiatives, including the ability to tailor the program to a particular state's market needs and budget situation.

This paper comprehensively reviews state-based tax incentives for the private sector. It also evaluates the ability of these programs to encourage the adoption of energy-efficient technologies and practices and identifies several options that appear the most promising.

Introduction

States play a fundamental role in addressing energy use and the adoption of energy efficiency measures at the regional and local level. They can provide tax incentives that foster technology options that will meet the needs of their residents. This paper describes the current status of energy efficiency and "green building" tax incentives that states offer as of the end of 2001. Our goal is to assist state policymakers to design and evaluate their own programs by providing insights about current programs in other states.

Properly designed state tax incentives have both short-term and long-range benefits. In the short term, they can effectively increase the market share of advanced technologies and practices that otherwise would be harder for the state's residents, businesses, and other organizations to find. By themselves, the state's actions increase the visibility of the technologies and validate them with the state's credibility. At some point, the market share is large enough that the technologies or practices are clearly cost-effective and have broad support from those who profit from it. By then, state tax credits may no longer be needed, and building codes and other regulatory mechanisms can be revised to make use of the technologies or practices mandatory (Quinlan, Geller, and Nadel 2001).

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A long-term benefit of state-funded energy efficiency incentive programs is the increase in consumer choices due to encouraging innovation in the private sector. The programs benefit state energy, economic, and environmental objectives. The private sector needs encouragement to provide products and services to address broader energy security, system reliability, environmental, and economic goals. In particular, *market failures* limit private investment in cost-effective efficiency measures; for example, third-party decision makers in many situations discourage the adoption of efficient technologies. Tax credits can accelerate customer acceptance and increase market share for high-efficiency technologies and practices.

To maximize effectiveness, tax incentives should target cutting-edge, very high-efficiency products that customers might not find otherwise. The incentives should provide large enough incentives to affect decision-making while reporting requirements should be just stringent enough to make fraud insignificant. The following section describes state tax incentive programs. The next two sections, “Green Buildings Tax Credits” and “Efficient Product Tax Credits,” describe the most common tax credits in more detail. ACEEE’s recommendations for states are in the final section.

Overview of State Tax Incentive Programs

Arizona’s Energy-Efficient Homes income tax subtraction is a state income tax credit. The homeowner is allowed an income tax deduction of five percent of purchase price (up to \$5,000) if the residence is certified to be 50 percent more energy efficient than the 1995 model energy code (MEC) at closing. The average tax saving is \$190. Arizona employs the Home Energy Ratings System (HERS) for certification of potential savings. Ninety HERS points are required to qualify for 50 percent above the 1995 model energy code. Should the number of residences that qualify be larger than five percent of the total number of residences sold, the Arizona Department of Commerce Energy Office will adjust the eligibility criteria (AZ Leg 2001; RESNET 2001; Waschuk 2001).

Hawaii offers a tax credit program that covers both renewable energy and energy efficiency. Hawaii provides an income tax credit for resident individual or corporate taxpayers for installation of renewable energy systems and heat pump water heaters. Taxpayers receive up to 20 percent of the price of the installed heat pump water heater unit (up to \$400 for single-family homes and unlimited for commercial applications).

Idaho offers income tax deductions to residents for installation of insulation and alternative energy systems. Homeowners receive a deduction for the cost of insulation, storm doors, caulking, and weather-stripping. In the first year of operation, forty percent (up to \$5,000) of the cost of qualifying installations may be deducted. For the three years after installation, twenty percent (up to \$5,000 a year) of the costs may be deducted (IDWR 1995). Participation is low due to low tax rates in Idaho: the maximum value of the deduction to the taxpayer is \$390.

Maryland has two tax incentives promoting energy efficiency. The first is a sales tax waiver for consumers who purchase qualifying vehicles and certain ENERGY STAR[®] appliances (Osann 2001). The second is a green buildings program that began implementation in 2002 and closely mirrors the New York program described below.

New Jersey offers incentives to industries that employ cogeneration facilities as a source of power. The New Jersey program, which started in 1998 when the retail sale of gas and electricity became subject to sales tax, creates exceptions to this rule for cogeneration facilities (Liebowitz 2001). Cogeneration facilities are granted a tax exemption for all purchases of natural gas and utility service for use in the production of electricity (NJ Tax 2001).

New York will begin implementing a green buildings program in 2002. The income tax incentive is intended to spur growth of the green building market including energy efficiency measures. This was the first state program of its kind, but has been adapted by several other states.

Oregon offers a range of energy efficiency tax incentives for green building, businesses, and residents (OOE 2001). These programs began in the late 1970s during the oil embargoes and have been expanded and updated to reflect changing markets.

Green Buildings Tax Credits

The term “green buildings” is used broadly to describe buildings that are resource-efficient, built using sustainable products, and in locations that are environmentally preferred. Advocates assert that green building credits encourage the use of clean materials, clean power, and less polluting building materials. This improves the quality of life for building occupants, as well as public health. Green buildings criteria go well beyond energy efficiency of the structure to include siting criteria and give credit for the use of recycled materials.

Some states have encouraged green buildings through an income tax credit for builders, developers, owners, and/or tenants. New York and Maryland have both passed similar income tax credit legislation and planned on implementing in early 2002. Nonprofit and citizen groups in Massachusetts modeled bills they introduced to the Massachusetts legislature in 2001 after the New York and Maryland laws. In contrast, Oregon’s legislation simply added green buildings as an integrated part of the Business Energy Tax Credit (BETC) in 2001.

New York

New York was first to implement a green building tax credit. The Natural Resources Defense Council (NRDC) originated a legislative campaign in the state in 1995 while working with the U.S. Green Building Council (USGBC) on development of the Leadership in Energy and Environmental Design (LEED) guidelines. At that time, the New York State budget was in surplus, and lobbying campaigns for tax credits were relatively successful. A diverse coalition provided the level of support needed for passage, while broadening the scope of the legislation.

New York’s legislation was signed into law in 2000. It stipulated that the New York State Department of Environmental Conservation (DEC) was responsible for developing the regulations for buildings to follow in order to receive credits. Those regulations were compiled by a broad-based advisory committee of industry and nonprofit professionals. The DEC adopted regulations in June of 2001 (NYDEC 2001). The legislation further directed

that these regulations be reviewed and updated every two years, providing an opportunity for evaluation and update. This program is currently being implemented.

Maryland

The Maryland green buildings bill was introduced in the 2001 session, with significant input from the New York green buildings legislation, but with modifications based on a review of that law and on differences between the market for buildings in Maryland and New York. Like the New York bill, the Maryland bill was championed by public interest organizations in the state, such as the Natural Resources Defense Council (NRDC). The Maryland green buildings legislation (SB 745) was enacted in May 2001.

In Maryland, credits will begin to be offered in fiscal year 2003 (July 2002). In order to qualify for the credit, builders have to meet criteria published by the Maryland Energy Administration (MEA), consistent with the criteria developed by the Maryland State Green Building Council (established in 2001). MEA has indicated that they will use LEED certification to qualify, with other stipulations as described in Table 1.

Massachusetts

A coalition of nonprofit organizations and other advocates introduced a bill similar to the New York and Maryland laws in Massachusetts in 2001. In addition to the similarities there are differences that accommodate the specific needs of the state.

The bill includes funding for both an education program and an implementation program. It authorizes \$150,000 in developer education programs for assistance in participating in the program. The money will help in early adoption and innovation and help the building industry apply the methodologies of sustainable buildings. Massachusetts estimated that the public benefit payback period will be six years, with a public profit from the credit of over 6 million dollars after ten years. In the private sector, costs include increased construction costs for green building features; benefits include reduced utility costs, higher productivity, and reduced operating and maintenance costs. The private sector payback is projected at two years (GBREB 2001). Due to budget restrictions, this bill was not passed in the 2001 session.

Oregon

Oregon offers a green building incentive program labeled *Sustainable Buildings* as part of its BETC program. *Sustainable Buildings* is the newest part of the BETC. Implementation began in October 2001 (Elias 2001).

This program is significantly different from the other green buildings programs because it uses the LEED standard ratings system to determine the level of tax credits for applicants. Like the rest of the BETC credits, the credit is available for up to 35 percent of the full cost or incremental cost of the new building or renovation project (up to 10 million dollars per project), but the credit is broken down by dollars per square foot available according to the LEED Silver, Gold, and Platinum Certification criteria (GBREB 2001).

Table 1. Green Building Bills in New York, Maryland, Massachusetts, and Oregon

		New York	Maryland	Massachusetts	Oregon
Total Aggregate credits		25 Million			No Limit
Timing	Certificates issued	2000–2004	2003–2011	In Legislation	Indefinite
Allowed for taxable years		2001–2009	January 2003	In Legislation	Indefinite
Available after		June 1, 1999	July 1, 2001	In Legislation	January 1, 2001
Credit divided over		5 years	5 years	5 years	5 years; if less than \$20,000, then the credit can be taken in 1 year.
Refundable		No	Unknown	Unknown	Unknown
Unused credit		Passed to new owner/tenant			Determined by administrator
Eligible Taxpayers		Corporations, utilities, bank, insurance companies and individuals	Residential and commercial owners/tenants	Owner, developer, and tenant	Oregon state taxpayers
Eligible Buildings		Commercial hotels and office buildings >20,000 sf of interior office space or multi-family buildings (>12 units) with 20,000 sf of interior space	Commercial buildings/multi-family	Commercial or residential (>12 units) greater than 20,000 sf	All buildings that can qualify for LEED Certification
Eligibility certificate		A state-licensed architect or engineer required to certify eligibility of all components that qualify for credit every year. The taxpayer is required to submit the certificate with tax forms.			Pre- and post-certification for the U.S. Green Building Council
Components of Credit		Green whole building credit component			LEED Silver Certification, including first available points for energy efficiency and commissioning
		Green base building credit, green tenant space component, fuel cell component, and photovoltaic credit			
		Green refrigerant component	Wind turbine component credit		

		New York	Maryland	Massachusetts	Oregon
Standards		Based on NYS Energy Conservation and Construction Code, and others developed by an advisory committee run by NYSERDA and DEC	Statute puts forth some requirements, requiring a 35% new (25% renovation) improvement over ASHRAE 90.1-1999. Other standards are modeled after the LEED 2.0 certification.	To be determined by the Division of Energy Resources	LEED Certification standards
Required record-keeping		Taxpayer is required to maintain and provide record to the implementing agency every taxable year.			
Regulators		NYS DEC, NYS Dep't of Finance, and the NYS Dep't of Education	MEA and Dep't of the Environment	Division of Energy Resources	Oregon Energy Office
Evaluation	Who	NYS Dep't of Finance and DOEC, with NYSERDA	Comptroller, MEA, Dep't of the Environment	Division of Energy Resources	Evaluated with the Business Energy Tax Credit Process
	When	Final 2008	April 1, 2005	April 1, 2006	Periodic
Allowable Cost Credit	Whole	7% of eligible costs	8% of eligible costs	7% of eligible costs*	35% of eligible project costs
	Green base building	5% of eligible costs,*	6% of eligible costs	5% of eligible costs*	
	Tenant space	5% of eligible costs*	6% of eligible costs	5% of eligible costs*	
Cost Caps	Base	\$150 per sf	\$120 per sf	\$150 per sf	LEED Based
	Tenant	\$75 per sf	\$60 per sf	\$75 per sf	
Education		None	None	\$150,000	None, website includes case studies.

* Add 1% when building in economic development area

In order to make the LEED certification more closely resemble regulatory language, the Oregon Statute requires other stipulations described in Table 1. The Oregon Office of Energy (OOE) felt comfortable using LEED as a certification standard rather than writing their own for a number of reasons, including: (1) the certification is already written, (2) the architectural and engineering communities are already familiar with LEED, and (3) pre- and post-certification can be mandated by the state.

OOE avoids the administrative costs of this program by requiring the applicant to pay certification costs, including the cost of obtaining the certificate of the USGBC, and the costs incurred by the Energy Office for application processing.

Summary of Green Buildings Incentives

Green buildings legislation has advanced greatly since its original inception with LEED in the mid-1990s. With laws being implemented in multiple states and travelling through the legislative sector of others, it appears that green buildings legislation may become the most widespread of the state tax credits. The variation on the New York law to conform to the needs of Maryland and Massachusetts shows not only the versatility of the language, but is also an example of how legislation can evolve and change with each new state. The Oregon program takes a different approach to accomplish the same goal, showing that there are many ways to implement green buildings legislation.

Efficient Product Tax Credits

Some states have found value in relatively inexpensive incentives for energy-efficient products and techniques for residential and business customers. These state programs encourage innovations in efficient technology while lowering first cost to the customer. The long-term benefits of these programs include reduction in pollution and lower utility bills. The specific lessons learned from these programs are the following:

- In general, programs should be designed around the needs of the constituents as well as the revenue and environmental needs of the state.
- Set appropriate caps for these programs, so there is not substantial revenue lost to the state.
- Include a mechanism to review revenue losses and program performance. If tax expenditures are running higher than anticipated, it may indicate that performance thresholds for credits should be raised.

Maryland

This legislation substitutes sales tax relief for utility funding in order to help transform demand for energy-efficient appliances in the consumer market in Maryland. Qualifying equipment and vehicles are listed in Table 2.

The Maryland legislation went into effect on July 1, 2000 and will end on July 1, 2004. Many of the qualifying appliances have staggered start dates to coordinate with the start dates for new federal efficiency standards (Osann 2001). The state estimates a revenue loss of \$1–2 million per year, or about \$0.20–0.40 per capita per year (DLS 2000).

Two important components are missing from the Maryland legislation that were problematic during initial introduction and may limit long-term effectiveness of the tax credit program. First, the legislation does not include funding for program implementation. Instead, MEA was tasked with implementing the program and “internalized” the implementation costs within its budget. This has resulted in very limited marketing. The second missing component is the lack of evaluation included with the program. Evaluation is important for both mid-program changes and future program improvement. Because Maryland’s program complements the federal ENERGY STAR program, we can estimate the effectiveness of the program with ENERGY STAR data. D&R International, a consulting firm in Maryland, tracks

sales of ENERGY STAR appliances nationwide, including Maryland. The fraction of ENERGY STAR appliances sold in Maryland ENERGY STAR partner stores does not differ from national averages (Hazard 2001). Retailers report that the incentive does not single-handedly sell products, but combined with the retailers' ability to explain the benefits of energy efficiency to the customer (lower running cost, higher quality), the incentive helps to sell the products.

The lack of implementation funding in Maryland also affects the energy-efficient motor vehicle portion of the program. Again, due to lack of funding Maryland does not offer retail staff training at dealerships. MEA is, however, attempting to work with the Maryland Department of Motor Vehicles (MDDMV) to develop an evaluation program for the vehicle side of the program (Mudd 2001). Another early problem is that implementation of the titling tax reduction for electric and hybrid vehicles is based on a federal standard that never passed. When the federal standard was not enacted, Maryland did not have the financial ability to design such a test. Therefore, instead of working on a sliding efficiency scale, all hybrid and electric cars were given the full refund. This system is fair at the current time, as both the hybrid cars available (Honda Insight and Toyota Prius) are very efficient. When the availability and variation within hybrid cars expands, however, there will be variability in their efficiency (Osann 2001).

A salesman at Toyota's Bethesda dealership, said that the "sales tax rebates are great" but also noted that with a consistent three month back-order for Prius models since they were introduced, he wouldn't say that the rebates were definitely bringing in additional buyers (Pang 2001).

Minnesota

A bill providing for a sales tax exemption for consumers of energy-efficient products was enacted in June 2001. It reflected concern about rising gas and electricity prices during the previous winter. The bill was based on a list of efficient household appliances that could reduce peak load and overall energy use in Minnesota, and culled based on the effect on energy use especially at peak times, the political process, the degree of market penetration already exhibited by the product, and the amount of tax revenue lost from the state. The final list is in Table 2.

The final law stipulated a timeline of August 1, 2001 until July 31, 2005. There is no evaluation scheduled for this program. The Minnesota Department of Revenue was tasked with implementing the program and has indicated that it will do so through mass mailings to retailers.

The Minnesota Department of Revenue estimated revenue losses of \$35.8 million in FY 2002, rising to \$41.5 million in FY 2005. The Minnesota estimates were based on the Minnesota portion of national sales data, multiplied by the expected fraction of ENERGY STAR-labeled sales as provided by the U.S. Environmental Protection Agency. However, the legislation that passed only includes a few of the products included in the original bill and thus the cost of the bill, as passed, will be much lower than these figures.

In the aftermath of the oil embargo of 1973 and the energy crisis of 1979, several programs aimed at conserving energy and resources were created. Oregon has two tax incentive programs currently operating that have saved consumers millions of dollars since their inception. These programs were specifically designed to deal with both private

businesses and residential consumers and have found enthusiastic support from legislators, retailers, and manufacturers, as well as consumers.

Oregon Residential Energy Tax Credit Program (RETDCP)

This program has increased in scope and performance level required to obtain the credit at a steady pace since its inception in 1979. The traditional focus of the program has always been on conserving resources, therefore it was initially focused on renewable technologies but has expanded to include appliances. Also included are alternative fuel vehicles and compressed natural gas fueling stations (Nesmith 2001).

Every year, approximately 20,000 tax credits are granted according to a set of standards created by OOE and described in Table 2. These standards often exceed ENERGY STAR standards and are performance based, with credit amounts based on savings produced or production derived from eligible products. Clothes washers, refrigerators, and dishwashers have been the most popular appliances being purchased with the tax credit. However, the recent addition of furnaces to the list of appliances has led to a huge increase in the number of credits being taken.

The largest cost of the Oregon program is administrative since there is no application fee charged to the consumers. Instead, when the program was started it was allotted a portion of money from the state's general fund to cover the administrative costs of processing the tax credits. As the program grew in popularity, the administrative costs grew to be much larger than expected. Even so, the total cost of all the Oregon energy efficiency tax incentives is around 10 dollars per Oregon resident.

Oregon's Residential Energy Tax Credit Program (RETCP) is successful for several reasons. One reason for the success of Oregon's RETCP is ease of use. Since Oregon has no sales tax, the credit is income tax based. By making the credit application available at the point of purchase, the program makes it consumer-friendly. Oregon is working to automate the system so the consumer can apply for the tax credit at the store instead of having to mail in the credit application (Stephens 2001). Possibly the most important factor in the programs success, however, and the hardest to emulate, is the constituency for the program that exists in Oregon. The people of Oregon have a history of embracing energy efficiency, so there is a large use of the credit program.

Oregon Business Energy Tax Credit Program

These credits cover all energy conservation projects including renewable retrofit projects. For retrofit projects, the eligible costs include all energy-related project costs including engineering and architectural expenses. New construction and replacement of equipment that is beyond its service life are limited to the extra cost of making the replacement 10 percent better than standard industry practice or required building code. Case studies are available at the Oregon Office of Energy website (<http://www.energy.state.or.us/bus/tax/taxcdt.htm>).

When the program was first started, the state legislature set a \$40 million per year cost limit on the business energy tax credit in order to limit the revenue impact. The last

session of Oregon’s state legislature removed the cost cap completely and the revenue impact is expected to be about 17 million dollars.

Hawaii

The state of Hawaii has an extensive income tax credit program for the private sector that covers both renewable energy and energy efficiency. The Hawaii Energy Tax Credit (Senate Bill 2092, Act 163) is scheduled to expire in 2003. This bill provides an income tax credit for individual or corporate resident taxpayers for installation (after 1989) of renewable energy systems and heat pump water heaters (HPWHs). Taxpayers receive up to 20 percent of the price of the installed heat pump water heater unit (up to \$400 for single-family homes and unlimited for commercial applications).

The market size for HPWHs is currently not well characterized. However, in 1995, the Pacific Northwest Laboratory estimated that the number of single-family residential HPWHs installed since 1979 in Hawaii was about 25,000 and that the number of HPWHs serving multi-family residences was about 35,000 (PNL 1995). Although there has been extensive evaluation of the solar incentive, there has been little written regarding evaluation of the HPWH program. One of the largest suppliers of HPWHs to Hawaii is ColMac, Coil Manufacturing. Ryan Lawrence, commercial sales representative with ColMac, offered his own evaluation of the credits (Lawrence 2001). Lawrence said that the 20 percent credits “have made a difference. They definitely make sense, because the big challenge is the up-front capital cost.”

Table 2. Qualifying Efficient Products in States with Incentives

Minnesota	<ul style="list-style-type: none"> • ENERGY STAR compact fluorescent bulbs and light fixtures • Electric heat pump hot water heaters (EF >1.9) • Natural gas water heaters (EF >0.62) • Natural gas furnaces (AFUE >90%)
Maryland	<ul style="list-style-type: none"> • ENERGY STAR clothes washers, room AC, refrigerators • Central air conditioner (>SEER 13.5) • Heat pump (electric) SEER >13.5, and HSPF >7.5 • Heat pump (natural gas) coefficient of performance: heating >1.25 and cooling: >0.70 • Hot water heater (electric heat pump) EF >1.7 • Hot water heater (natural gas) EF >0.65 • Fuel cell (electricity generation efficiency >35%, and generating capacity >2 kW)
Hawaii	<ul style="list-style-type: none"> • Renewable energy systems • Heat pump water heaters
Oregon	<ul style="list-style-type: none"> • ENERGY STAR clothes washers • Dishwasher (savings >157kW/h) • Refrigerators (15% better than 2001 standards) • Air conditioning systems (SEER >15 or EER >13) • Combo space and water heating systems (AFUE of >90% and ECM) • Ducts: sealing existing ductwork or installing a well-designed and sealed system • Furnaces (AFUE >90%)and boilers (AFUE >88%) • Heat pump systems (HSPF >8.5, SEER > 13, EER > 11) • Geothermal space heating/ground-source heat pumps • Water heaters (>70% efficiency rating)

Recommendations

Based on the research compiled in this report, we offer the following recommendations to create effective state tax credits to encourage energy efficiency:

Efficient Product Sales and Income Tax Credits

Sales tax waivers are generally the lowest cost of the tax credits and are attractive because of their administrative ease. First, they are implemented primarily at the retail level, involving only staff training to sell a product that is more profitable for the retailer. Second, selection of products is on a pass/fail basis; i.e., either the product is eligible or it is not. Choosing products is also easy since other states have already set guidelines or the federal ENERGY STAR program can be used as a baseline.

Green Buildings Tax Credits

Encouraging resource efficiency in the building industry has large payoffs in that there are many opportunities for energy and monetary savings. These programs have higher costs associated with them than the credits above and require setting regulations or using a third-party scoring system, such as the LEED ratings system. We recommend that the following aspects of tax credit legislation deserve legislative focus.

Funding for implementation and evaluation. The best designed programs will not encourage market change without good market implementation. Funding for these activities should be included when developing a program. Planning for periodic evaluation of the program is also very important.

Sunset dates. The goal of sunset dates is to accelerate adoption of advanced technologies in the market. We recommend that each program have a “sunset” or expiration date, or a provision to periodically tighten qualifying levels, so credits continue to spur market development for energy-efficient innovations.

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