

# Sustainably Funding Local Energy Efficiency Initiatives

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## ABSTRACT

In recent years there has been increasing excitement in U.S. energy policy circles around new and emerging opportunities for energy efficiency *project financing*, but comparatively little discussion has been had about sustaining *program funding*. In spite of this, many U.S. communities have recently adopted mechanisms for sustainably funding their energy efficiency programs. These communities can serve as important examples for other communities that hope to sustain their efficiency efforts with long-term programs. In this paper, we describe several local funding options based on a review of more than 50 different programs nationwide, and we provide examples of where each type of mechanism has been adopted. Options for funding programs include utility partnerships; licensing, service, or waste fees; energy or carbon taxes; systems benefit funds; and bonds. We also discuss options that capture the long-term returns created by avoided energy costs in order to create self-sustaining funds that can be used to maintain programs, such as revolving loan funds.

## Introduction

Federal programs funded through the American Recovery and Reinvestment Act of 2009 (ARRA) provided unprecedented funding to local governments for energy efficiency. Initial investments have already been made by hundreds of local governments in energy efficiency projects, programs, policies, and staff capacity. However, much of this federal funding expires in 2012, leaving many newly established initiatives without future funding sources. Additionally, the recession and resulting drop in local government revenues has created an environment where any planned expenditures may be subject to funding cuts.

While these opportunities have generated increased excitement around new and emerging prospects for energy efficiency *project financing* (DOE 2010; EPA 2011a), there has been comparatively little discussion about sustaining *program funding*. A recent survey of local communities found that, out of 38 responding communities, the vast majority relied on one-time funding sources (ICLEI 2011). Luckily, local governments have several options to transition their energy efficiency initiatives into sustainably funded programs.

Sustainable program funding mechanisms ensure that non-utility programs implementing efficiency are maintained and continue to complement or supplement utility energy efficiency programs and state policies. Sustained program funding provides an opportunity for communities to develop capacity and processes to fill gaps in the energy efficiency marketplace. Such sustained efforts can address multiple barriers to energy efficiency. They can connect decision-makers with better information about efficiency opportunities, shift social norms through marketing and engagement, develop a network of resources for guidance and technical assistance, implement enabling policies, connect capital with investment opportunities, and

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document the resulting energy savings. The process of cultivating this funding is the topic of this paper.

## **Why Local?**

Energy efficiency can and should be integrated into the long-term planning of local governments. Energy efficiency programs with sustainable funding structures enable communities to plan and manage a long-term approach to improving energy efficiency rather than limiting them to one-time projects or adoption of discrete technologies. Programs designed to have sustained funding and human resources allow for the regular identification of new efficiency opportunities and development of continuous improvement processes designed to capture them. Sustainable local efficiency funds have the potential to contribute to the transformation of the market for efficiency from one characterized primarily by technology-specific financial incentives, often funded in fits and starts, to a market with consistently available capital devoted to performance-based and continual improvement.

While many aspects of advancing energy efficiency have typically been handled by state governments and utilities, local communities also have the authority to successfully implement energy efficiency initiatives. While utility efficiency efforts, where they exist, remain essential, energy efficiency initiatives spearheaded at the local level provide an opportunity for innovation in program delivery and policy beyond what is offered by investor-owned utilities. Local program administrators are often able to be more flexible in program design when compared to regulated utilities, who are often constrained by the details of cost-benefit tests and lengthy approval processes. In states that are aggressively pursuing energy efficiency, local communities can play a major role in developing new strategies that complement or drive demand to existing state and utility efforts. Communities in states taking little action on efficiency can become leaders in their state through improving energy efficiency in government operations and developing policies to improve access to information on energy savings opportunities for the community as a whole.

Additionally, many local initiatives allow non-traditional levers to be applied to the delivery of energy efficiency and market transformation. Local initiatives often have influence over a broad variety of activities including planning, policy, programs, and projects. These levers can be used to develop strategies that complement and address gaps in utility programs. The scale of local programs also enables close coordination between each kind of influence to remove barriers to efficiency, actions that are often impractical or intentionally segregated at the state or national level and often not allowed from utilities without significant regulatory oversight. For example, energy efficiency programs can be integrated into local economic development plans, a task that could be more difficult in a state or federal bureaucracy. In communities with municipal utilities, meaning the energy utility is a department of the local government, incentives for action on energy efficiency are often more easily aligned because policymakers and program implementers are a part of the same organization. Examples of the variety of documented local energy efficiency activities include:

- Planning – energy benchmarking at the building and community scales, efficiency targets, energy consumption or emissions reduction targets (Mackres and Kazerooni 2012)

- Policy – building codes, energy use disclosure requirements, building energy improvement requirements, energy taxes, parking pricing, and enabling policies for programs (Busche 2010; Mackres et al. 2012)
- Programs – energy management in government operations (EPA 2011b), private building retrofits including finance (residential or commercial revolving loan funds, loan loss reserves, PACE, on-bill finance), financial incentives, workforce development, marketing and education (DOE 2012), transportation mode shift, telecommuting (EPA 2011c)
- Projects – energy retrofits and retrocommissioning to local government buildings, vehicle fleet improvements, energy-efficient transportation infrastructure investments (Black et al. 2009)
- Staffing – continuous employment of skilled and experienced staff can increase energy savings through their efforts to identify and implement efficiency activities (LGC undated a)

Local efforts often have the added flexibility of organizational arrangements and partnerships. Local government efforts are generally run out of a local government department—often environment, planning, or public works—or led out of the mayor’s or county manager’s office by a sustainability director or similar position with responsibilities across departments (Mackres and Kazerooni 2012). These government-led efforts are often focused on decreasing energy use of local government operations through projects, but in some case their responsibilities also include policies and programs to improve energy efficiency across sectors in the community at large. Alternatively, local energy efficiency partnerships, also referred to as Local Energy Alliances (CESI 2010a), are public-private partnerships often run out of an independent or quasi-governmental nonprofit organization. Many of them have been developed through collaboration among local governments, foundations, and businesses. These organizations are typically primarily focused on delivery of energy efficiency services for owners or occupants of residential and/or commercial buildings and transformation of the local market for building energy services. Some also provide energy efficiency services for public buildings as a secondary focus.

These two categories of local initiatives have their own levers and strengths for delivering energy efficiency, and each has advantages and disadvantages in terms of developing sustainable funding sources. Government initiatives are often effective at leading by example and can result in the implementation of policies that encourage or require energy use reductions and increased consideration of energy consumption in the local real estate market. In contrast, because partnerships often have more flexibility in the activities they can undertake, they can be more effective at connecting a larger number of customers with energy efficiency services and attracting private capital. With a few exceptions, the funding mechanisms discussed in the following sections can be employed by both of these organizational arrangements and applied to efficiency initiatives that are focused on government operations exclusively, or on community-wide efforts.

## **Funding Mechanisms: Seed and Sustainable**

In the context of this report, we distinguish between two types of funding; “sustainable” funding and “seed” funding. Seed funding opportunities are one-time or temporary sources of funding, such as grants or bond issuances. These are in contrast to sustainable funding

mechanisms, which can be sustained over a period of many years and/or can be renewed, resulting in a relatively steady and continuous revenue stream. Examples of sustainable funding mechanisms include utility ratepayer funding, dedicated taxes, and fees. In addition to these funding sources, in this paper we look at approaches to sustainable funding that are self-sustaining. For example, revolving loan funds are typically viewed as a “project funding” mechanism, but they can be made self-sustaining by design. Both seed and sustainable funding can be used to pay for many aspects of a project or program. For example, seed funding is particularly useful to establish a program and pay for startup costs while sustainable funding mechanisms often have the added flexibility of supporting both upfront costs and costs associated with program maintenance. Ideally, these sources of funding will be used in combination. While many energy efficiency investments pay for themselves in the form of energy savings and other benefits, a significant barrier is obtaining upfront capital. A parallel predicament exists on the program level as well. Programs can be structured to pay for themselves and sustain a pool of investment capital; however, many require an upfront investment of capital to establish the initial pool of funds.

The next section describes significant funding mechanisms that are well-suited to developing and maintaining local programs (summarized in Table 1) and also provides examples of programs where each of these mechanisms are in use. Case studies for the examples cited in Table 2 are included in *Keeping It in the Community: Sustainable Funding for Local Energy Efficiency Initiatives*, a report that expands on the content included in this paper (Mackres and Hayes 2012).

**Table 1. Overview of Funding Mechanisms**

<b>Funding Mechanism</b>	<b>Seed or Sustainable</b>	<b>Description</b>	<b>Pros</b>	<b>Cons</b>
<b>Grant</b>	Seed	A one-time or short-term source of funding granted for a specific purpose.	Do not need to be repaid.	Can be highly competitive. May have limits on use.
<b>Bond</b>	Seed	Debt instruments issued by local governments to raise capital.	Can be used to accumulate large pools of money for specific purposes.	Must be repaid with interest. Upfront transaction costs can be high.
<b>Internal Loan</b>	Seed	Local governments borrow funds from other operations to fund upgrades. Loans are repaid through energy cost savings.	Funds can often be borrowed at low or no interest and repaid through bill savings.	Availability is often limited. Must be repaid.
<b>Allocation from (Quasi-) Governmental Fund</b>	Seed	Appropriations from existing local government funds.	Can be used to develop a large capital pool.	Can be difficult to obtain and sustain when communities are facing budget shortages.
<b>Fee</b>	Sustainable	User charges for public services.	Can be easier to establish than taxes.	Additional charges for government services can financially impact low- and fixed-income citizens.
<b>Tax</b>	Sustainable	Fixed allocation from	Can be tied directly	Can be politically

<b>Funding Mechanism</b>	<b>Seed or Sustainable</b>	<b>Description</b>	<b>Pros</b>	<b>Cons</b>
		general revenues or separate program tax.	to specific consumptive activities such as pollution or garbage.	and/or legally difficult to implement.
<b>Benefits District</b>	Sustainable	Revenues are raised from geographically defined benefit districts.	Program is funded by beneficiaries of efficiency upgrades.	Can be complicated and resource-intensive to develop and administer without existing district entities.
<b>Leveraging of Utility Investments</b>	Sustainable	Funds from investor-owned utility via partnerships, trust funds, and/or sustainable energy utilities.	Can provide access to additional utility resources, such as potential program participants and savings opportunities.	Programs may be subject to additional regulatory oversight. Business interests of utilities can conflict with program goals.
<b>Revolving Loan Fund</b>	Sustainable	A capital pool that is loaned in a way that allows funds to be recycled in perpetuity.	Can be structured to include program costs. Program generates funds (self-sustaining).	Works best with projects with short paybacks, limiting usefulness as a means for sustainable program funding.
<b>Charges for Services</b>	Sustainable	Charges for energy efficiency services or other value-added service provided to program participants or contractors.	Self-sustaining. Funding is directly connected with program delivery and funded by program beneficiaries.	Requires an established client network that recognizes the value of services.
<b>Markets for Efficiency (emissions trading, forward capacity markets)</b>	Sustainable	Financial markets aimed at valuing the multiple social goods of energy efficiency.	Can create a revenue stream by monetizing the benefits of energy efficiency.	Opportunity cost of participation can be high and is often geographically specific.

## Seed Funding Mechanisms

**Grants.** Grants are available from a range of sources including federal, state, and local governments, as well as private sources such as foundations. Grants generally do not need to be repaid, but tend to be a one-time or short-term source of funding. Grants may include restrictions on how they can be used, but often provide more flexibility than other funding options and are particularly good for covering initial program startup costs and funding pilot programs.

A major grant opportunity that was recently available to local communities was the Energy Efficiency and Conservation Block Grant (EECBG) program. The EECBG program was funded through the American Recovery and Reinvestment Act of 2009 (ARRA), which allocated over \$2.7 billion to large cities and counties. EECBG grants funded a wide variety of energy efficiency activities such as energy planning, building energy retrofits and weatherization, building code development and implementation, energy-efficient street lighting, and development of combined heat and power (Mayors 2011). EECBG funds could also be used for financial mechanisms such as revolving loan funds and loan loss reserves. While the EECBG

funding has expired, smaller federal programs, state programs (Sciortino 2011), foundations, and other private funds continue to offer grants related to energy efficiency to local governments.

*Examples: Miami-Dade County Renovation for Energy Efficient Loan Program (REEL) (revolving loan fund capitalized with EECBG funds); Massachusetts Green Communities Program (state funder of many local programs); Portland, Oregon, Office of Sustainable Development (program start-up costs paid for by a grant from the Bullitt Foundation); and Chicago area Energy Savers Program (program start-up costs paid for by a grants from the MacArthur Foundation, Polk Brothers Foundation, and the U.S. Department of Energy).*

**Bonds.** Bonds are debt instruments that can be sold or “issued” by local governments to raise capital. In exchange for the issuance of debt, the local government agrees to repay the debt plus interest. The issuing government will typically make payments to bondholders at regular intervals from general funds (general obligation bonds) or from specified revenues (revenue bonds). General obligation bonds rely on the binding promise of the issuer to repay. Governments can generally raise taxes to cover these payments, which means they are lower risk and can be issued at a lower interest rate. Voter approval of general obligation bonds is generally required. Revenue bonds can allow repayment to be tied to savings from efficiency programs and projects, but because the repayment of these bonds is viewed as riskier, interest rate payments are generally higher. Because taxes cannot be levied to repay revenue bonds, they may not require voter approval.

The federal government has created Qualified Energy Conservation Bonds (QECBs), tax credit bonds that may be used by local governments to finance energy conservation projects. In 2010, the QECB program was modified to include an option whereby the bond issuer can receive a direct subsidy from the U.S. Department of Treasury in the form of a tax credit to the bond issuer equal to 70% of the lower of the interest rate on the bond or the maximum interest rate set by the Treasury. This option allows governments to subsidize the interest payments on QECBs with a credit from the Department of Treasury. Qualified issuers include state, local (including municipalities and unincorporated counties), and tribal governments that have been allocated the right to issue QECBs by the federal government.

Each state receives a QECB allocation, a portion of which is allocated to "large local governments" — municipalities and counties with populations of 100,000 or more. QECBs can be used to fund “qualified energy conservation projects,” including energy upgrades of public buildings, loans and grants for community programs, mass transit facilities, demonstration projects, and education campaigns. There is currently no cut-off date by which allocations must be used.<sup>2</sup>

*Examples: Ann Arbor Municipal Energy Fund (originally funded by a municipal general obligation bond and made self-funding by extending the bond payment line item after repayment); Saint Louis County, MO Sustainable and Verifiable Energy Savings (SAVES) program (residential retrofit program seeded with QECB issuance); and Boulder County, CO ClimateSmart Loan Program (a residential and commercial PACE financing program seeded with funds from municipal bonds and a QECB issuance).*

**Internal loan.** In many cases, local governments can borrow funds at low or no interest from elsewhere in their operations to fund energy efficiency. Using this loan mechanism, local

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<sup>2</sup> The National Association of State Energy Officials (NASEO) provides technical assistance on QECB here: <http://naseo.org/resources/financing/qecb/index.html>

governments can pay upfront program costs while saving the bulk of their budgets for efficiency improvements. The department managing the loan funds can pay for the upfront costs of the efficiency improvements for the other departments as long as the energy cost savings accrue to them to repay the borrowed funds and, if possible, to replenish the capital pool for efficiency investments. This variation is a form of a value capture public finance, which could perhaps be more appropriately termed “reduced liability capture” in that it is appropriating future departmental energy cost reductions to finance upfront investments on behalf of all departments.

*Example: Eugene, Oregon Energy Management Program (borrowed \$2 million from city’s “Fleet Fund” for government vehicles, repaid with a new facility occupancy charge)*

**Allocation from an existing governmental or quasi-governmental fund.** Another method for developing a capital pool to cover upfront investments is through a one-time appropriation or a series of annual appropriations from an existing local government fund to develop a large capital pool. These source funds can range from the government’s general fund or other governmental funds (e.g., Ann Arbor); dedicated agency or trust funds that can be used for energy, waste, or environmental purposes (e.g., Babylon); or other quasi-governmental local enterprise or service funds (e.g., Long Beach). Often, successfully making the case for such an allocation revolves around providing evidence that it will provide considerable cost savings, be managed effectively, and that such spending matches with community or organizational priorities.

*Examples: Ann Arbor Municipal Energy Fund (repayment of an energy bond was extended for six years beyond payoff); San Luis Obispo County Utility Coordinator (position funded by general fund paid through indirect and overhead charges to departments); and Babylon Long Island Green Homes Program, Long Beach Office of Sustainability (definition of “solid waste” expanded to make available a surplus from the town’s Solid Waste Reserve Fund).*

## **Sustainable Funding Mechanisms**

**Fees.** While taxes and fees have many similarities, in many states fees can provide an advantage in that they can be easier to establish than taxes. Funds can be raised through a dedication of funding from an existing fee or the establishment of a new fee. Many communities who already had fees in place for solid waste, recycling, water, or wastewater services have applied these funds to energy initiatives. These fees usually take two forms: franchise fees or customer fees.

Franchise fees are paid by a private company contracting to provide services within the community. Typically these fees are the payment for the use of a public right-of-way or other public infrastructure. Clackamas County, OR uses franchise fees from solid waste and recycling services to fund its Sustainability Office (ICLEI 2011). Other important local government franchise agreements in which fees to be used for energy efficiency can be negotiated include those with energy utilities, cable television providers, and telecom companies.<sup>3</sup> For example, Denver was able to expand its Low-Income Energy Assistance Program with additional fees from the city’s franchise agreement with Xcel Energy (Greenprint 2007).

Customer fees are charged directly to residential, commercial, and industrial users of a public service such as water or energy distribution, or waste collection. Typically fees are

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<sup>3</sup> Policies that advance energy efficiency can also be negotiated as part of franchise agreements. For example, energy-efficient television set-top boxes can be required as a condition of local cable franchise agreements (Hardy et al. 2011).

charged at a flat rate set by customer class or based on the level of use by the customer of the public service (e.g., kilowatt-hours of electricity, cubic feet of waste, or gallons of water).

Many investor-owned utilities fund energy efficiency services through a system benefits charge (SBC) added to customers' energy bills. An SBC is often required or encouraged by state utility regulators and the funds are required to be used for energy efficiency or other system improvement activities (e.g., renewable energy or low-income programs). Generally, system benefit charges must be legislated or approved by a utility's regulating body. In many states, local governments can also levy a surcharge on energy used. Funds from these charges can be managed by utilities, government bodies, or contracted third parties.

*Examples: Babylon, NY (defined carbon emissions as solid waste, 3% administrative fee); Berkeley, CA (RECO administration fee); Seattle, WA (vehicle licensing fee used to pay for transit investments); and Clean Energy Works Oregon (uses ratepayer fee managed through Energy Trust of Oregon).*

**Taxes.** Communities can decide to allocate some fixed amount from general tax revenues for efficiency efforts, but preferably taxes would be tied directly to the program funded.

Some communities have passed small taxes specifically to fund clean energy programs. These have been applied to both large industrial consumers and residential electricity users. These taxes are often implemented based on emissions of carbon dioxide or on consumption of energy, but they could be applied to a range of activities. For example, taxes could be levied on buildings based on floor space, vehicles based on fuel economy, or the sale of appliances that don't meet minimum efficiency guidelines.

*Examples: Boulder, CO (tax on electric bills of residential users); Montgomery County, MD (\$5 per ton tax on CO<sub>2</sub> emissions from power plant); Arlington County, VA (residential utility energy consumption tax); and Seattle, WA (Commercial Parking Tax and other transportation-oriented taxes used to fund energy-efficient transportation infrastructure).*

**Partnerships with investor-owned utilities.** In many parts of the country, investor-owned energy utilities have substantial energy efficiency programs and funding sources. Utilities are increasingly interested in working in partnership with local governments and other local organizations to improve program delivery, improve customer satisfaction, and meet state energy efficiency targets. Some of these existing partnerships are ad hoc efforts, or in a pilot phase, but others have begun to have impacts in many communities. In the states where partnerships are most developed, they are usually the result of state utility policies that encourage the pursuit of efficiency through methods beyond traditional utility customer incentive programs. Most of the funds available to local governments through the partnerships are for supporting the innovative delivery of specific utility programs, but some are more flexible and can be used for energy management in municipal facilities, development of customized programs, or even policy adoption. In some partnerships, utilities do not provide grant funding but instead provide expanded technical assistance to local governments at no cost.

*Examples: Massachusetts Community Mobilization Initiatives (Utilities: NSTAR and National Grid, Communities: Boston Chinatown, Chelsea, Lynn, New Bedford, and Springfield); California Local Government Partnership Programs (Utilities: Southern California Edison, Pacific Gas & Electric, SoCalGas, and San Diego Gas & Electric, Communities: over \$270 million over three years invested in dozens of communities around the state, through grants to cities, counties and regional entities); Allegheny County Energy Program for Municipalities*



*(Utility: Duquesne Light Co., Community: Allegheny County, PA); and Denver Municipal DSM Program (Utility: Xcel Energy, Community: City of Denver, CO).*

**Municipal utilities and sustainable energy utilities.** Communities served by municipal energy utilities often have more direct control over community-wide energy efficiency programs and policy because the local government acts as the utility regulator. Many municipal utilities run energy efficiency programs for their customers, most often funded through rates.

Although not a minor effort, some communities also have the option of developing a Sustainable Energy Utility (SEU), with the mission of expanding energy efficiency and clean energy sources, to work alongside traditional utilities. As a last resort for ambitious communities, many local governments also have the authority to charter new municipal utilities.

*Examples: Austin, TX (Austin Energy is a large municipal utility that runs extensive energy efficiency programs); Columbia, MO (a smaller municipal utility with energy efficiency programs); District of Columbia (established a Sustainable Energy Utility based on the experience of states like Vermont and Oregon); and Boulder, CO (recently voted to establish a new municipal utility with the aim of expanding clean energy programs).*

**Departmental bill surcharges.** Surcharges can be added to energy bills by a local government's facilities department, or equivalent, before the energy costs are passed on to each department. The funds collected through the surcharge are used to pay for staff that identify and implement efficiency investments for each department or to pay for the efficiency measures themselves. With this model, departments pay for upfront costs of energy improvements over time through the surcharge, but directly receive all costs savings that result from improvements in energy management in the form of lower utility bills.

*Examples: Alameda County, California Designated Energy Fund (in 2010, the surcharge applied to departmental energy bills was 9-11% and paid for all county staff time related to energy management and energy efficiency, while most capital costs for efficiency measures were funded from other sources (LGC undated b)).*

**Charges for energy efficiency services.** This funding source is worth discussing separately because it is a funding mechanism with the potential to be self-sustaining as funds are generated directly through program delivery. These charges are the direct result of the provision of energy efficiency services, a role played in administering a program, or other value added service provided. These charges only apply to program participants or other parties directly involved with the program, not the general public. For example, a local government or local energy efficiency organization could charge a fee for each project completed (at a flat rate or as a percentage of investment), pass along direct labor costs, charge a fee for administering a loan fund, collect commissions from vendors based on referrals, or enter into a "pay-for-performance" contracts with utilities (CESI 2010b). In most cases, these fees can be structured to ensure that program participants still achieve a net cost savings as a result of energy efficiency investments even after paying the fee.

*Examples: Babylon, NY Long Island Green Homes Program (3% administrative fee); U.S. DOE Better Buildings Neighborhood Program Communities (Greater Cincinnati Energy Alliance—OH and KY, Local Energy Alliance Program—Charlottesville, VA); Metropolitan Energy Center (Kansas City) Home Performance with ENERGY STAR program (a memorandum of understanding outlines fee structure paid to nonprofit partner by utility).*

**Revolving loan funds.** Sustainable management of existing funds is an important funding source in itself. Revolving loan funds for energy efficiency are capital pools that are loaned, not granted, in order to allow for the funds to be recycled in perpetuity for future energy improvement projects. Typically, for projects with a short payback period or loans with a low interest rate, loan payments can be structured to allow the payments to be made entirely from the avoided costs resulting from energy savings. In order to ensure the fund is not depleted, many revolving loan funds have conditions regarding investment cost-effectiveness, and may base repayment on estimated, rather than achieved, energy savings. As a result of ARRA, the number of state and local energy efficiency revolving loan funds has grown considerably. The number of revolving loan funds for university and campus energy efficiency has also grown considerably over the past decade (SEI 2011).

*Examples: San Jose Energy Fund (funded from utility rebate check, replenished by incentives and two years of expected savings from projects); Ann Arbor Municipal Energy Fund (80% of the estimated resulting energy cost savings are used to make annual payments back into the Energy Fund); Union County, NC and Chapel Hill, NC (100% of energy savings are reinvested in fund); and Orlando, FL (100% of energy savings during payback plus one year).*

**Benefit districts—PACE and EcoDistricts.** Energy efficiency can be funded through revenue raised from existing or new geographically defined benefit districts. There are a variety of funding options available at the district level. Special-assessment districts include local improvement districts (LIDs), business improvement districts (BIDs), and Property Assessed Clean Energy (PACE). In addition there are non-tax assessed funds such as tax increment financing (TIF), urban renewal areas, and system development charges/impact fees (PSI 2011). These district financing models are already in place in communities around the country, but in most cases are not yet being used to encourage energy efficiency. The Chicago Small Business Improvement Fund is an example of a TIF district being used to finance energy efficiency investments for businesses (ACEEE 2011). Two approaches that have perhaps received the most attention are PACE and EcoDistricts.

PACE districts allow building owners to pay for energy efficiency improvements over a period of years through a special assessment on their property taxes. Although the development of most PACE programs for residential buildings has been stymied by federal housing agency intervention, a growing number of programs for commercial buildings are now up and running. In addition to financing for individual projects, PACE can also provide funding for program implementation through interest or fees associated with a PACE transaction.

“EcoDistrict” is a general term to describe a neighborhood or district that has made a commitment to sustainability. Actions taken can include setting goals, directing investments, and tracking performance for reduction in resource use, including energy. The DowntownDC ecoDistrict is identical in geography to, and organized by, the DowntownDC Business Improvement District. Alternatively, EcoDistricts can be coordinated by new entities.

*Examples: Five neighborhoods in Portland, Oregon (EcoDistricts); Chicago Small Business Improvement Fund; Seattle 2030 District; DowntownDC ecoDistrict; and Sonoma County Energy Independence Program (PACE).*

**Secondary markets for efficiency loans.** Loans used to finance energy efficiency projects are generally low-risk investments. These loans can be assembled into portfolios for sale on a

secondary market. The money from this sale can be used to recapitalize the loan pool. Resale of efficiency loans is a large potential source of funds; however, this approach requires that the loans are standardized so that they may be aggregated. This is a challenge, in large part, because individual building retrofits can vary widely from building to building. Communities desiring to use this approach must consider these factors at the early planning stages of the program and will need to balance project uniformity against limits on the types of projects that can be funded.

*Example: We are not aware of any local governments that have successfully used this approach to date, though the Pennsylvania Keystone Home Energy Loan Program has offered a portfolio for sale on the secondary market.*

**Markets for efficiency.** There are emerging financial markets aimed at valuing the multiple social goods of energy efficiency. Each market has its own rules, meaning that opportunity costs of participating can be high and local governments may not be eligible to participate in all cases. Many markets are also geographically-specific, bound by state policies, regional agreements, or electric system territories.

Tradable permit mechanisms for energy savings are known by several variations including “energy efficiency credits” and “white certificates.” These mechanisms are similar to renewable energy credits (RECS) in that they are tradable permits that can be used to meet energy efficiency resource standards (EERS). This mechanism is in use in Connecticut, Michigan, Nevada, and Pennsylvania (Loper et al. 2010).

ISO New England, which oversees New England’s bulk electric power system and wholesale electricity markets, has established a Forward Capacity Market (FCM) that will pay suppliers to ensure sufficient capacity is available to meet future peak loads. This market allows energy efficiency and other demand resources to compete directly with generators. Efficiency resources must meet specific standards of reliability and verifiability.

The reduction of emissions attained through energy efficiency means that energy efficiency is also of value in markets developed to reduce air pollution. In the NO<sub>x</sub> SIP Call, the Title IV Acid Rain Trading Program, and the Regional Greenhouse Gas Initiative (RGGI), there were opportunities to earn tradable allowances through the implementation of energy efficiency measures.<sup>4</sup>

*Examples: ISO New England Forward Capacity Market (energy efficiency can be bid into the wholesale electricity market for future year delivery); Massachusetts NO<sub>x</sub> SIP Call (energy efficiency set-asides); and Sterling Planet and DTE Energy White Tags Program (utility offers customers tradable credits instead of rebates for efficiency activities).*

**Table 2. Funding Characteristics of Sample Programs**

Location	Program Name	Program Scope/Purpose	Seed Funds	Sustainable Mechanism
City of Ann Arbor, MI	Municipal Energy Fund	Improvements to government operations, demonstration & education, energy data	Extension of a bond repayment line item from the general fund	Reinvestment of energy cost savings
Arlington County, VA	Arlington Initiative to Reduce Emissions (AIRE)	Greenhouse gas reductions in county operations and for local businesses	General fund	Tax on utility energy provision
Town of	Long Island Green	Residential energy	Municipal Solid	Participant fee for

<sup>4</sup> See Hayes and Young (2012) for discussion of these opportunities.

<b>Location</b>	<b>Program Name</b>	<b>Program Scope/Purpose</b>	<b>Seed Funds</b>	<b>Sustainable Mechanism</b>
<b>Babylon, NY</b>	Homes (LIGH) Program	upgrades and program administration	Waste Reserve Fund	energy service, revolving loan fund payments
<b>City of Berkeley, CA</b>	Commercial and Residential Energy Conservation Ordinances	Implementation of mandatory efficiency standards for existing buildings	General funds for development of policy	Participant fees, general fund allocation
<b>Boulder County, CO</b>	ClimateSmart Loan Program	Energy improvements to existing commercial and residential buildings	Municipal bonds, Qualified Energy Conservation Bonds (QECCB)	Payments on Property Assessed Clean Energy loan obligations, program fees
<b>City of Chula Vista, CA</b>	Local Government Partnership with San Diego Gas & Electric	Citizen education and outreach, free building evaluations, customer financial incentives	Program grants from local investor-owned utility mandated by state	Program grants from local investor-owned utility mandated by state
<b>District of Columbia</b>	Sustainable Energy Utility	Customer energy efficiency incentives and technical assistance programs for residential and commercial buildings	Clean and Affordable Energy Act (CAEA) established an energy surcharge	Surcharge on customer utility bills contributing to the Sustainable Energy Trust Fund
<b>Eugene, OR</b>	Energy Management Program	Municipal operations efficiency improvements	Intra-governmental loan	Departmental facility occupancy charge set at a fixed level
<b>Metropolitan Energy Center (Kansas City region, MO)</b>	Home Performance with ENERGY STAR program	Home energy retrofits and program administration	Fee for service contract with electric and gas utilities	Fee for service contract with electric and gas utilities
<b>Portland, OR</b>	Clean Energy Works	Home energy retrofits and program administration	City funds and EECCBG	Ratepayer funds, loan payments recycled into revolving loan fund
<b>Saint Louis County, MO</b>	Sustainable and Verifiable Energy Savings (SAVES)	Residential home energy retrofits, interest rate buydowns, and program administration	QECCB (bonds) and EECCBG grants	Loan payments with interest rates designed to cover program administration costs

## Common Practices in Developing Sustainable Funding Mechanisms

The program management approaches that best ensure that energy efficiency efforts will be funded and sustained over the long term are those that are tailored to the unique needs of the communities they serve. However, there are several practices that communities have commonly applied when establishing their own sustainable funding mechanisms. Some of the practices are just principles of good program management, others focus on long-term program planning and continual improvement, while still others focus on building a constituency that values continued energy efficiency activities.

## **Leverage Seed Funds**

A community can make the most of these one-time funds by using them to develop a program that can later be sustained through other funding sources. Start-up or expansion costs can often be significant: development of marketing materials, creation of a website, and staff training are examples of the types of one-time upfront expenses that a long-term program can incur.

## **Leverage Existing Resources**

Funds can be stretched further by taking advantage of existing resources. Many organizations, such as utilities and local nonprofit organizations, may have complementary interests, resource, and expertise and, as a result, may also benefit from local energy efficiency programs. Communities can build long-term support for energy efficiency efforts by partnering with utilities and community organizations.

## **Design Self-Sustaining Programs**

The money saved from energy efficiency improvements can be earmarked specifically for reinvestment in the program that created the savings. A revolving loan fund is another approach for a self-sustaining program. Money can be lent from this pool in an amount, and at an interest rate, that will ensure that the pool is maintained or increased.

## **Validate Program by Tracking Energy and Cost Savings**

Energy savings goals provide a metric for measuring the success of the program and demonstrate to current and potential funders that the investment will have a tangible benefit. Benchmarking the performance of assets allows for continual program improvement and the comparison of energy consumption before and after efficiency investments. Finally, achievement of energy savings goals should be evaluated, measured, and verified (EM&V) using standardly accepted procedures. Solid EM&V can be used to expand support for the program by providing an opportunity for the program to become part of a larger energy savings goal (such as a state energy efficiency resource standard) and/or part of a government's air quality planning process. In addition, evaluation of the financial impacts of a program, such as a fiscal impact analysis, can demonstrate the returns on investments generated by energy efficiency programs and help to justify government appropriations and targeted fees.

## **Dedicate Staff Time and Oversight**

Human resources are often the most important factor in the success of a program. Trained and experienced staff can identify and highlight program design strengths and weaknesses and modify efforts to achieve the best results. Consistent staffing for a program is essential for the development of a continuous improvement approach to energy management that moves beyond a narrow project focus. Dedicated staff can ensure a program is responsive to evolving community needs and can be responsive to input from program participants and community leaders.

## **Reduce Risk of Funding Loss**

If possible, funds should be maintained outside of general government accounts. This may be in the form of a public-private partnership managed by a nonprofit organization or quasi-governmental agency. This can reduce the risk that funds will be raided as part of a budget reallocation while also avoiding the potential to trigger automatic spending procedures that may apply to disbursements of general funds. Other mechanisms such as capital reserve funds can also reduce these risks. Sources of funding that require an annual allocation subject to approval by a political body are likely to be less certain than sources of funding that are generated by the program itself. In addition to considering these factors, program administrators should consider diversifying funding sources to reduce the risk that a program will need to be cancelled if one stream of funds is cut off.

## **Diversification of Energy Initiatives among Projects, Policies, and Programs**

Diversification can mitigate risks by helping to ensure that if any particular project does not achieve expected results, the entire effort will still achieve its goals. Diversification can also encourage buy-in from the community as more people are likely to benefit from and see the impacts of a range of projects. Finally, diversification provides the opportunity for a community to balance invest in measures with quick paybacks as well as those that have paybacks over a longer term.

## **Focus on Community Needs and Values**

Advocating for funding involves messaging about the program the money will support. Sensitivity to local politics and community values is an important part of ensuring the message resonates with decision-makers and the general public. In addition, the program should be developed with stakeholder feedback, which can be used to identify new opportunities and improve programs.

## **Cultivate Champions and Partners**

Programs that have advocates in government and the community may be less likely to have their funding cut. Further, partnerships allow for the synergies among the energy efficiency program, the other priorities of the local community, and the state to be identified and incorporated. These can be a powerful tool in advocating for potential funding sources.

## **Conclusion**

A number of strategies can be employed to provide long-term funding for local efficiency initiatives including utility partnerships; licensing, service, or waste fees; energy or carbon taxes; systems benefit funds; and bonds as well as options that capture the long-term returns created by avoided energy costs, such as revolving loan funds. Communities that leverage these funding opportunities in combination with available seed funding, can develop long-term, continual improvement approaches to energy use while meeting a variety of community goals.

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