

Keeping It in the Community: Sustainable Funding for Local Energy Efficiency Initiatives

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About ACEEE

ACEEE is a nonprofit organization that acts as a catalyst to advance energy efficiency policies, programs, technologies, investments, and behaviors. For more information, see www.aceee.org. ACEEE fulfills its mission by:

- Conducting in-depth technical and policy assessments
- Advising policymakers and program managers
- Working collaboratively with businesses, public interest groups, and other organizations
- Organizing conferences and workshops
- Publishing books, conference proceedings, and reports
- Educating consumers and businesses

Projects are carried out by staff and selected energy efficiency experts from universities, national laboratories, and the private sector. Collaboration is key to ACEEE's success. We collaborate on projects and initiatives with dozens of organizations including federal and state agencies, utilities, research institutions, businesses, and public interest groups.

Executive Summary

Initial investments have already been made by thousands of local governments in energy efficiency projects, programs, policies, and expanding staff capacity, but most federal funds that have supported these efforts are expiring. Some communities have considered or adopted sustainable funding mechanisms for their energy efficiency investments. These efforts provide important examples for other communities hoping to sustain funding for their efficiency efforts.

This report is intended for communities looking to sustain their energy efficiency efforts and provides actionable program funding options and information to policymakers and staff. It provides local communities with descriptions of model funding mechanisms that can help them to ensure that efforts to improve energy efficiency at the local level can be maintained once federal funding is depleted. It also discusses common practices used in developing sustainable funding sources and includes examples and case studies of programs that are successfully using these funding mechanisms to achieve their energy efficiency goals.

We distinguish between two types of funding: “sustainable” funding and “seed” funding. Seed funding opportunities are one-time or temporary sources of funding. The seed funding mechanisms include grants, bonds, internal loans, and allocations from existing funds. This is 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. In addition to these sustainable sources, programs that are self-sustaining by design can be funding mechanisms. Sustainable funding mechanisms include franchise, service, and waste fees; carbon, energy, or other taxes; benefit districts; leveraging utility investments; markets for energy efficiency characteristics; and self-sustaining strategies like revolving loan funds or energy efficiency service charges.

Common practices used in developing sustainable funding mechanisms includes leveraging seed funds; leveraging existing external resources; designing self-sustaining programs; tracking and verifying energy and cost savings; dedicated staff; reducing risk of funding loss; diversifying initiatives; focusing on community needs and values; and cultivating champions and partners.

Sustainable funding mechanisms are essential to ensure that non-utility efficiency programs are sustained 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 document the resulting energy savings.

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

investments and continual improvement. These programs need reliable, sustainable funding to consistently achieve results.

Introduction

In recent years there has been increasing excitement around new and emerging opportunities for energy efficiency *project financing* (DOE 2010; EPA 2011a), but comparatively little discussion focused on new *program funding* mechanisms. These mechanisms ensure that non-utility programs implementing efficiency are sustained 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 document the resulting energy savings. These programs need reliable, sustainable funding to consistently achieve results. The process of cultivating this funding is the topic of this report.

This report looks specifically at progress being made in the area of local program funding. Many local governments and local nonprofit public-private partnerships are developing alternative models to fund the sustained delivery of energy efficiency improvements. Providing sustained energy efficiency services is a new, or much expanded, role for many local governments, who have historically been more concerned with funding for other environmental services (e.g., water, wastewater, open space) (EPA 1994), and have not focused as heavily on addressing energy issues. Generally, states have more experience in developing funding mechanisms for energy efficiency than localities (EPA 2008). There is much that localities can learn from the experience of states, but there is also much to learn from the recent experiences of other localities, as we will explore.

CURRENT CONTEXT

Recent federal programs, notably the Energy Efficiency and Conservation Block Grant (EECBG) funded through the American Recovery and Reinvestment Act of 2009 (ARRA), provided unprecedented funding to local governments for energy efficiency. As a result, initial investments have already been made by thousands 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 local initiatives without future funding sources. Additionally, the recession and resulting drop in local government revenues has created an environment where many planned expenditures may be subject to funding cuts.

Last year ICLEI USA, a local government association that focuses on fostering urban sustainability, surveyed its members about the funding streams supporting their sustainability and energy activities. They found that, out of 38 responding communities, the vast majority relied on one-time or year-to-year funding sources: 55% were fully or partially dependent on appropriations from a general fund,¹

¹ General fund appropriations are not one-time funding sources and are a very important part of the funding mix for local energy activities. However, these funds are typically allocated on an annual basis and can be less secure than other

29% relied on EECBG or other ARRA funds, and 24% relied on foundation grants or partnerships. A smaller, but significant, number received at least some funds through a more sustainable, ongoing mechanism: 37% received some funds from fees or rebates and 16% received funds based on their accomplished cost savings (ICLEI 2011a). These results show that significant progress toward establishing sustainable funding sources has been achieved in some communities. However, many respondents also expressed concerns about their ability to continue their efforts into the future after stimulus funds were expended and/or expected cuts to their general fund budgets were completed. Luckily, local governments have several options to transition their energy efficiency initiatives into sustainably funded programs, while, in many cases, simultaneously improving their overall fiscal standing and financial resilience.

Why Local?

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.

Additionally, many local initiatives allow non-traditional levers to be applied to energy efficiency delivery 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 among 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. Local governments have successfully led a variety of energy efficiency activities, including:

- *Planning*—developing approaches to energy benchmarking at the building and community scales; establishing efficiency, energy consumption, or emissions reduction targets; and developing and pursuing energy efficiency action plans (Mackres and Kazerooni 2012).

mechanisms, especially when local government revenues and budgets are shrinking. The focus on sustainable funding sources in this report is intended to assist decision-makers in *diversifying* revenue sources to allow activities to be planned over a multi-year period and to reduce the risk of programs being completely defunded. General Fund revenue, as well as other seed funding sources, should continue to be a part of this diverse funding mix.

- *Policy Adoption*—policies adopted at the local level include 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).
- *Program Development*—programs have included energy management in government operations (EPA 2011b), private building retrofits including finance (residential or commercial revolving loan funds, loan loss reserves, Property Assessed Clean Energy [PACE], on-bill finance), financial incentives, workforce development, marketing and education (DOE 2012), transportation mode shift, and telecommuting (EPA 2011c).
- *Project Implementation*—locally driven energy efficiency projects include energy retrofits and retrocommissioning to local government buildings, vehicle fleet improvements, energy-efficient transportation infrastructure investments (Black et al. 2009).
- *Staffing*—consistent employment of skilled and experienced staff focused on community energy management can enable a continuous improvement approach to energy—regularly identifying and implementing efficiency activities—leading to regular increases in energy savings (LGC undated a).

A VISION FOR SUSTAINED LOCAL ENERGY EFFICIENCY INITIATIVES

Energy efficiency can and should be integrated into the long-term planning and activities of local governments, as appropriate to each community. 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 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 investments and continual improvement.

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-saving opportunities for the community as a whole. In either of these policy environments, energy efficiency can contribute to accomplishing many local objectives:

- Improvements in the energy efficiency of local government operations (e.g., buildings, vehicles fleets) can *reduce maintenance and operating costs*.
- Integration of energy efficiency into community design and public service provision (e.g., transportation infrastructure, water and wastewater, and energy distribution infrastructure) can *reduce or avoid capital costs*. These avoided costs can, in turn, decrease or prevent increases in local taxes or utility rates.

- Efficiency can improve the economic strength, resilience, competitiveness, and wealth of a community. Energy cost savings to businesses and households allow for those funds to be spent elsewhere, which can result in *more investment in the local economy* than would have occurred from spending those funds on imported energy.
- Energy efficiency can *create local jobs*, both through direct employment in projects and programs, and through the reinvestment by consumers and businesses of energy cost savings in local businesses and services (ACEEE 2011d).
- Efficiency can *improve local energy security* through decreasing demand for resources from outside the community.
- Efficiency can *reduce greenhouse gas emissions and other air pollutants*, an important objective for many communities focused on addressing climate change or environmental health concerns.

Funding Mechanisms: Seed and Sustainable

Many energy efficiency investments pay for themselves in the form of energy savings and other benefits, but a significant barrier is obtaining upfront capital. This predicament exists on the program level as well. Some programs, such as those designed as revolving loan funds, can be structured so that they pay for themselves and sustain a pool of investment capital; however, to do so requires an upfront investment of capital to establish the initial pool of funds. Other programs, because of their goals or design, will not be able to become self-funding, but reliable funding sources dedicated to these programs can still be cultivated to ensure the program operation beyond the period its initial funding supported.

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. This is 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 sustainable sources, programs that are self-sustaining by design can be funding mechanisms, such as a well-managed revolving loan fund. Both seed and sustainable funding can be used in combination to pay for many aspects of a project or program. For example, seed funding is particularly useful when used for one-time costs such as to establish a pilot program and pay for startup costs. In contrast, sustainable funding mechanisms often have the added flexibility of supporting both upfront costs and costs associated with ongoing program administration.

The next section describes significant funding mechanisms that are well-suited to developing and maintaining local programs (summarized in Table 1) and provides examples of programs where each of these mechanisms is in use. While not all examples cited are described in detail, those listed in Table 2 are each described in the short case studies included in Appendix A. Sources of additional information for all examples cited are included in Appendix B. We have tried to provide high quality citations where readers can find additional information on the mechanisms. Additionally, the case

studies included in Appendix A provide a snapshot of several mechanisms in place in a particular locality.

Table 1. Overview of Funding Mechanisms

| Funding Mechanism | Seed or Sustainable | Description | Pros | Cons |
|---|----------------------------|--|---|--|
| Grants | 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. |
| Bonds | 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. |
| Internal Loan | 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. |
| Allocation from (Quasi-) Governmental Fund | 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. |
| Fees | 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. |
| Taxes | Sustainable | Fixed allocation from general revenues or separate program tax. | Can be tied directly to specific consumptive activities such as pollution or garbage. | Can be politically and/or legally difficult to implement. |
| Benefits | Sustainable | Revenues are | Program is funded | Can be |

| Funding Mechanism | Seed or Sustainable | Description | Pros | Cons |
|---|---------------------|--|---|--|
| Districts | | raised from geographically defined benefit districts. | by beneficiaries of efficiency upgrades. | complicated and resource-intensive to develop and administer without existing district entities. |
| Leveraging Utility Investments | 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. |
| Self-Sustaining Strategy: Revolving Loan Fund | 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. | Works best with projects with short paybacks, limiting usefulness as a means for sustainable program funding. |
| Self-Sustaining Strategy: Charges for Services | Sustainable | Charges for energy efficiency services or other value-added service provided to program participants or contractors. | Funding is directly connected with program delivery and funded by program beneficiaries. | Requires an established client network which recognizes the value of services. |
| Markets for Efficiency (emissions trading, forward capacity markets) | 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 through formula and competitive grants. 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 for local governments (Sciortino 2011), foundations, and other private funds continue to offer grants related to energy efficiency to local governments.

Examples:

- *Massachusetts Green Communities Program (state program funding many local programs)*
- *Clean Energy Works Oregon (revolving loan fund capitalized with EECBG funds)*
- *Chicago, IL area Energy Savers Program (program start-up costs paid for by 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 other 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.

The federal government has created Qualified Energy Conservation Bonds (QECCBs), tax credit bonds that may be used by local governments to finance energy conservation projects. In 2010, the QECCB 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 QECCBs with a credit from the Department of Treasury. Qualified issuers generally include state, local (including municipalities and unincorporated counties), and tribal governments that have been allocated the right to issue QECCBs by the federal government.

Each state receives a QECCB allocation, a portion of which is allocated to “large local governments”—municipalities and counties with populations of 100,000 or more. QECCBs 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 (NASEO 2012). As of January 2012, only \$614 million of the \$3.2 billion allocated to QECCBs had been issued by state and local governments (Bellis 2012a). These unissued bonds represent a huge potential seed funding source for energy efficiency programs.

Examples:

- *Ann Arbor, MI 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 QECCB issuance)*
- *Boulder County, CO ClimateSmart Loan Program (a residential and commercial PACE financing program seeded with funds from municipal bonds and a QECCB 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, the department managing the loan funds can pay for the upfront costs of the efficiency improvements for other government departments or private entities 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.

Example: Eugene, Oregon Energy Management Program

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, MI Municipal Energy Fund*
- *San Luis Obispo County, CA Utility Coordinator*
- *Babylon, NY Long Island Green Homes Program*
- *Long Beach, CA Office of Sustainability*

SUSTAINABLE FUNDING MECHANISMS

Fees

Funds for deploying energy efficiency can be raised through user fees on public service provision—either energy or non-energy related. While taxes and fees have many similarities, in many states and communities fees can provide an advantage in that they can be easier to establish than taxes because of the legal procedures applied to each. Funds can be raised through a dedication of funding from an existing fee or the establishment of a new fee. Many communities that already had fees in place for solid waste, recycling, water, or wastewater services have applied these funds to energy initiatives. These energy-related fees usually take two forms: franchise fees or customer fees.

Franchise Fees and Procurement Agreements

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 2011a). 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.² For example, the city of 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). Similarly, due to its aggregated energy demand, the nonprofit Northeast Ohio Public Energy Council was able to negotiate with energy suppliers for discounted energy rates as well as \$16 million in funding for public benefit programs, including energy efficiency, for members communities in the nine-county region it serves (NOPEC 2012). Similar public aggregation agreements for energy supply, also known as community choice aggregation, are possible in at least six states—California, Illinois, Massachusetts, New Jersey, Ohio, and Rhode Island—that allow direct wholesale procurement of electricity and natural gas by local governments for their communities (Marshall 2010).

Utility Customer Fees

Utility 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 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).

² 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).

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, 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:

- Clean Energy Works Oregon (uses ratepayer fee managed through Energy Trust of Oregon)
- DC Sustainable Energy Utility (fund by ratepayer contributions to Sustainable Energy Trust Fund)

Other Service Fees

Local governments provide other services or approvals indirectly related to energy efficiency for which fees are charged. These include vehicle permits, parking permits and fees, building permitting, and business licenses. Revenues from these fees can be applied in part or in full to energy efficiency efforts.

Examples:

- *Babylon, NY (defined carbon emissions as solid waste to allow waste fund to be applied energy efficiency)*
- *Berkeley, CA (RECO administration fee)*
- *Seattle, WA (vehicle licensing fee used to pay for transit investments)*
- *Other localities that use service fees to fund energy initiatives include El Paso, TX, Flagstaff, AZ, La Crosse, WI, and Portland, OR*

Departmental Bill Surcharges

Within a local government, policies can be established to add surcharges to the energy bills of local government departments. The local government's facilities department, or equivalent, adds the surcharge before the bills are passed on to each department. The funds collected through the surcharge can be used to pay for staff to identify and implement efficiency investments across all departments and/or to pay for the efficiency measures themselves. With this model, departments pay for the costs of energy improvements over time through the surcharge and then each department directly receives all the cost savings that result from improvements in energy management in the form of lower utility bills. Under this model, departments have an incentive to pursue energy efficiency to ensure that they get benefits from the surcharge they are paying anyway. An additional incentive is also present because if they reduce their energy bills, they are free to apply these bill savings to their program budgets.

Example: Alameda County, CA uses this model for its 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.

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 consumers and residential electricity users. These taxes are often implemented based on consumption of energy or emissions of carbon dioxide, but they could be applied to a range of activities. For example, taxes could be levied on buildings based on floor space, on vehicles based on fuel economy or vehicle miles travelled, and on the sale of appliances that don't meet minimum efficiency guidelines. Taxes need not be directly related to energy. For example, applying revenues from casino taxes to energy efficiency has been considered in some communities (Morgan 2012).

Examples:

- *Arlington County, VA (residential utility energy consumption tax)*
- *City of Boulder, CO (tax on electric bills of residential users)*
- *Montgomery County, MD (\$5 per ton tax on carbon dioxide emissions from power plant, later repealed)*
- *Seattle, WA (Commercial Parking Tax used to fund energy-efficient transportation infrastructure)*

Benefit Districts

Energy efficiency can be funded through revenue raised from existing or new geographically defined benefit districts. There are a large number of variations in this topic area, but to energy and environmental professionals the two related concepts likely to be most familiar are Property Assessed Clean Energy (PACE) and EcoDistricts.

PACE

PACE programs allow building owners to pay for energy efficiency improvements over a period of years through a special assessment on their property taxes (RAEL 2009). The upfront efficiency investment costs in these programs are often financed through the sale of municipal bonds. 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 (LBNL et al. 2011). In addition to financing for individual projects, PACE can also provide funding to pay for program implementation through interest or fees associated with a PACE transaction. To work most cost-effectively, PACE programs require sustained, high levels of lending to participants (\$50-100 million per year, by some estimates) to ensure sufficient private sector demand for the bonds (Lin 2012).

Examples:

- *Sonoma County, CA Energy Independence Program*
- *Boulder County, CO Climate Smart Loan Program*

EcoDistricts and District Finance

“EcoDistrict” is a general term to describe a neighborhood or district that has made a commitment to furthering sustainability. Actions taken can vary but include setting goals, directing investments, and tracking performance for reduction in resource use, including energy. Five neighborhoods in Portland, OR have developed pilot EcoDistricts (PSI 2012). The downtown business communities in several cities, including Seattle and Washington, DC, have also begun implementing the concept. EcoDistricts can be built upon existing district organizations—as with the DowntownDC ecoDistrict, which is identical in geography to and organized by the DowntownDC Business Improvement District (2011)—or they can be coordinated by new entities—as with the Seattle 2030 District (2012).

There are a variety of funding options available at the district level. These include special-assessment districts—such as local improvement districts (LIDs), business improvement districts (BIDs), and also PACE—as well as 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 2011a). In these districts and across entire communities, funding for energy efficiency can be tied to increases property taxes within a jurisdiction. Such a funding mechanism has been proposed, but not implemented, in Virginia Beach, VA (Morgan 2012).

Examples:

- *Seattle 2030 District, WA*
- *DowntownDC ecoDistrict*
- *Chicago, IL Small Business Improvement Fund*
- *Seattle, WA Transportation Benefit District*

Leveraging Utility Investments

In many parts of the country, investor-owned energy utilities have substantial energy efficiency programs and funding sources. Local initiatives should be sure to understand the utility energy efficiency landscape in their communities and states and consider ways that these existing investments and related policies can be leveraged for their work.

Partnerships with Investor-Owned Utilities

Utilities are increasingly interested in working in partnership with local governments and other third-party organizations to improve program delivery, improve customer satisfaction, and meet state energy efficiency targets (Mackres et al. 2012). Some of these existing partnerships are ad hoc efforts, or in a pilot phase, but others have begun to have impacts in many communities around a state. In the

states and localities 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 these 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 (identifying energy-saving opportunities and connecting them with the appropriate programs) 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)*
- *East Bay Partnership, CA (Utility: Pacific Gas & Electric; Cities: Berkeley, Fremont)*
- *GreenWorks Orlando (City of Orlando and Orlando Utilities Commission)*
- *Allegheny County Energy Program for Municipalities (Utility: Duquesne Light Co.; Community: Allegheny County, PA)*
- *Denver Municipal DSM Program (Utility: Xcel Energy; Community: City of Denver, CO)*

Local Government Energy Trust Funds

Directing energy-related payments received by a local government or institution into a special fund can provide a nest egg for other future energy-related initiatives. The banking of utility financial incentives received for municipal energy efficiency, demand response, or other energy-related efforts is a common funding source for energy trust funds. In these cases, local governments adopt a policy of not applying incentives to a project budget or adding them to the general fund, but instead apply them to a dedicated energy fund. This source of funds can be sustainable as long as the local government continues to make efficiency investments for which there are utility incentives available.

Examples:

- Pittsburgh, PA Energy Trust Fund
- Duluth, MN Energy Management Fund
- San Jose, CA Energy Fund
- Alameda County, CA Designated Energy Fund

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. Some smaller municipal utilities have developed shared efficiency programs to serve multiple utilities in a region.

Communities that do not have a municipal utility but are interested in expanding energy efficiency services often work directly with the utility that serves them to negotiate improved services. Although not a minor effort, some communities also have the option to develop 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)*
- *Efficiency Smart (a program jointly offered to customers in 50 communities, mostly in Ohio, with municipal utilities that are members of American Municipal Power, Inc.)*
- *District of Columbia (established a Sustainable Energy Utility based on the experience of states like Vermont and Oregon)*
- *Boulder, CO (recently voted to establish a new municipal utility with the aim of expanding clean energy programs)*

Self-Sustaining Strategies

Revolving Loan Funds³

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 (DOE 2011b). Funds can be established to serve energy efficiency needs in government operations or in the private sector. 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 and that cost savings are achieved, many revolving loan funds have conditions regarding investment cost-effectiveness. Local government funds often base repayment schedules on estimated, rather than achieved, energy savings. In contrast, for community-focused revolving loan funds the repayment is usually based on fixed schedules independent of expected energy savings. As a result of ARRA, the number of state and local energy

³ There are several financing strategies that can be designed in a manner to improve the sustainability of overall programs; however, beyond revolving loan funds, most of them are not direct funding mechanisms and therefore are not covered in this report. For example, loan loss reserve funds, where public funds are used to provide security against default risk for loans funded by the private sector, are only depleted through defaults making them a sustainable fund useful for attracting private investment. For more resources on energy efficiency financing strategies, see Kats et al. (2012) and DOE (2010).

efficiency revolving loan funds has grown considerably. The use of this mechanism has also grown considerably at universities and campuses over the past decade (SEI 2011).

Examples:

Government Operations:

- *San Jose, CA Energy Fund*
- *Ann Arbor, MI Municipal Energy Fund*
- *Union County, NC; Chapel Hill, NC; and Orlando, FL revolving loan funds*

Private properties:

- *Babylon, New York, NY Long Island Green Homes*
- *Clean Energy Works Oregon*

Charges for Energy Efficiency Services

Program administrators can charge for the provision of energy efficiency services or other value-added service provided to program participants or contractors. These charges, usually in the form of a fee, allow a funding source to be directly connected with program delivery. These costs are only billed to program participants or other parties directly involved with the program, not the general public. 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 “pay-for-performance” contracts with utilities (CESI 2010b). Charges to participating contractors can be based on customer prequalification or provision of quality assurance or marketing services. Charges to program participants can include fees for providing financing, quality assurance services, or collecting available utility incentives. Finally, local program administrators and efficiency partners can develop service contracts with energy utilities to fulfill a variety of responsibilities. Activities connected to payments from a utility can range from full-service program delivery to marketing, quality assurance, reporting of energy performance data, and contractor recruitment and/or training. Established local program administrators may also be able to raise funds through providing consulting service to other communities or organization developing programs. The U.S. Department of Energy Better Buildings Neighborhood Program is helping its grantees to identify options for sustainable business models for their programs, many of which include fee-for-service revenue (DOE 2011a). Fees can also be applied to energy service performance contracts (ESPCs) to cover the costs of administration of an ongoing ESPC technical assistance program (ESC 2010). In most cases these charges 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% administration fee);*
- *Clean Energy Works Oregon*

- *Greater Cincinnati Energy Alliance (OH and KY), Local Energy Alliance Program (Charlottesville, VA), and other U.S. DOE Better Buildings Neighborhood Program Communities*
- *Metropolitan Energy Center (Kansas City, MO area) Home Performance with ENERGY STAR program*
- *Saint Louis County, MO Sustainable and Verifiable Energy Savings (SAVES)*
- *Washington, Kansas and Pennsylvania Energy Performance Contracting Programs*

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 the 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. In spite of these limitations, there are opportunities for local communities to leverage efficiency markets.

Tradable credit 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. They can be used to meet energy efficiency resource standards (EERS) in certain states. This mechanism is in use in Connecticut, Michigan, Nevada, and Pennsylvania (Loper et al. 2010). In these states, local governments and others can sell their efficiency credits to utilities to help them meet energy savings targets.

Forward capacity markets trade in the future provision of electricity resources for wholesale electricity markets. These markets, run by regional system operators, pay electricity resource providers to ensure sufficient capacity is available to meet future peak loads. Energy efficiency and other demand-side resources are eligible to participate alongside electricity generation resources in some of these markets, notably in the ISO-New England and PJM systems (Gottstein and Schwartz 2010). Local governments are eligible to bid their energy efficiency resources into this market and can receive payment for the system reliability provided. Several local governments and initiatives have bid energy efficiency resources into these markets, including the Cambridge (MA) Energy Alliance and municipal utilities like the Burlington (VT) Electric Department (ISO-NE 2012). Meeting participation requirements can necessitate outside technical expertise and considerable expense, however the resulting value to participants can be significant. For example, the Cambridge Energy Alliance received annual payments from ISO-New England on the order of \$20,000 for every million dollars invested in efficiency (Dayton 2012).

Energy efficiency is also of value in markets developed to reduce air pollution. In each of the NO_x 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 (Hayes and Young 2012). Under these mechanisms, pollution reductions from energy efficiency are awarded tradable credits in the form of “offsets” or “set asides.” These credits have a monetary value and can be sold on the market. While these mechanisms have not been widely used,

they provide an opportunity for communities to create a revenue stream based on the environmental attributes of the efficiency gains achieved through a measure, project, or program.

Energy efficiency is eligible in some voluntary carbon markets as well, although currently it makes up only a small portion of trading (Peters-Stanley et al. 2011). The Maine State Housing Authority has developed methodology to quantify the carbon emissions reductions resulting from its home weatherization programs. Through documenting the carbon savings, the agency is able to sell carbon credits on voluntary markets. The carbon quantification methodology has received approval from various experts and third-party validators, and is appropriate for use with single-family and multi-family homes in various locations (MaineHousing 2012).

Examples:

- *Sterling Planet and DTE Energy White Tags Program in Michigan*
- *ISO-New England Forward Capacity Market*
- *Regional Greenhouse Gas Initiative (RGGI) among northeastern U.S. States*
- *Massachusetts NO_x SIP Call*
- *Maine State Housing Authority Carbon Quantification Project*

Secondary Markets for Efficiency Loans

Loans used to finance energy efficiency projects are generally low risk investments (Hayes et al. 2011). 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.⁴ Resale of efficiency loans is a large potential source of funds; however, sale of these loan portfolios require meeting the expectations of capital markets. Private markets require a high volume of loans and a large loan portfolio and the loans and underwriting must be standardized so that they may be aggregated into a consistent financial product. This is a challenge, in large part, because individual building retrofits can vary widely from building to building (Byrd and Cohen 2011; Hayes et al. 2011). 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. Initiatives such as Warehouse for Energy Efficiency Loans (WHEEL) are working with loan programs to develop secondary market products that address these barriers (Bellis 2012b; Kats et al. 2012).

Examples: We are not aware of any local governments that have successfully used this approach to date. The Pennsylvania Keystone Home Energy Loan Program and the NYSERDA Green Jobs—Green New York program are both offering loan portfolios for sale on the secondary market but have not yet completed transactions.

⁴ This approach has some similarities to a “warehoused” PACE bond, in which loans issued under a PACE program are funded by a local government on an as-needed basis and revenue bonds are sold when enough loans have been closed, except that in such bond issuances the loans themselves are not sold, rather only the revenue associated with their repayment is sold (LBNL et al. 2011).

Table 2. Funding Characteristics of Case Study 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 Babylon, NY | Long Island Green Homes (LIGH) Program | Residential energy upgrades and program administration | Municipal Solid Waste Reserve Fund | Participant fee for energy service, revolving loan fund payments |
| City of Berkeley, CA | 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 |
| Boulder County, CO | 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 |
| City of Chula Vista, CA | 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 |
| District of Columbia | 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 |

| Location | Program Name | Program Scope/Purpose | Seed Funds | Sustainable Mechanism |
|--|---|---|--|--|
| Eugene, OR | Energy Management Program | Municipal operations efficiency improvements | Intra-governmental loan | Departmental facility occupancy charge set at a fixed level |
| Metropolitan Energy Center (Kansas City region, MO) | 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 |
| Portland, OR | Clean Energy Works | Home energy retrofits and program administration | City funds and EECBG | Ratepayer funds, loan payments recycled into revolving loan fund |
| Saint Louis County, MO | Sustainable and Verifiable Energy Savings (SAVES) | Residential home energy retrofits, interest rate buydowns, and program administration | QECB (bonds) and EECBG grants | Loan payments with interest rates designed to cover program administration costs |

Organizational Arrangements

Considering the different options for administering a program is also important when establishing sustainable funding sources. This decision is closely linked to the business model for the program (DOE 2011a). Perhaps most importantly, it is helpful to distinguish between local government efforts and local public-private partnerships.

Local government efforts are generally administered by 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 cases 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 administered by an independent or quasi-governmental nonprofit organization. Many of them have been developed through collaboration between 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.

The variations on these two categories of local initiatives have their own levers and strengths related to delivering energy efficiency, and each has advantages and disadvantages in 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. Because partnerships are often more flexible in the activities they can undertake and, in many cases, have fewer constraints on the funding sources they are able to pursue, they can be effective at connecting a larger number of customers with energy efficiency services and attracting private capital. Because of their independent or quasi-independent status, partnerships are also generally less vulnerable to being defunded when local governments are in a fiscal crunch. 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 focused on government operations exclusively or community-wide efforts. However, the applicability of any particular mechanism depends on the particular legal and political constraints in a community.

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 cost 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, resources, 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 the existing efforts of 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. The more self-sustaining a program is the less additional outside funding it will require.

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 investments 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 standard 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.

DEDICATE STAFF TIME FOR PROGRAM ADMINISTRATION

Human resources are often the most important factor in the success of a program. Some of the most successful programs recognize the importance of program oversight and administration, and dedicate specific resources to these tasks. 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.

DIVERSIFY ENERGY EFFICIENCY 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 invest in measures with quick paybacks as well as those that have paybacks over a longer period but may be of strategic value for the community. Although diversification of a local government's portfolio of efficiency activities is positive, diversification within specific programs may not be desirable because of added administrative burden and the lack of compatibility external factors (e.g., industry-wide program standards, secondary loan markets).

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 synergies between the energy efficiency program and 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

Although funding is a challenge for many local governments and stakeholders committed to energy efficiency, there are a variety of funding sources and strategies that can be employed to fund local efficiency initiatives. While several communities have already demonstrated this, there are many other local governments that could benefit. Taking advantage of available seed funding and establishing sustainable funding mechanisms through applying the practices cataloged here can allow communities to develop a long-term, continual improvement approach to energy management and achieve a variety of community goals.

References

- [ACEEE] American Council for an Energy-Efficient Economy. 2011a. “Case Study—Chicago Small Business Improvement Fund.” http://aceee.org/files/pdf/case-studies/Chicago_Small_Business_Improvement_Fund.pdf.
- . 2011b. “Arlington Initiative to Reduce Emissions (AIRE).” <http://aceee.org/sector/local-policy/case-studies/arlington-initiative-reduce-emissions>.
- . 2011c. “Case Study—Clean Energy Works Portland.” <http://www.aceee.org/sector/local-policy/case-studies/clean-energy-works-portland>.
- . 2011d. “How Does Energy Efficiency Create Jobs?” <http://aceee.org/fact-sheet/ee-job-creation>.
- Adams, D. Jensen. (Metropolitan Energy Center). 2011. Personal correspondence. March 20.
- Adams, D. Jensen. (Metropolitan Energy Center). 2012. Personal correspondence. April 5.
- [Ann Arbor] City of Ann Arbor. 2012 “Energy Fund.” Accessed 30 January. http://www.a2gov.org/government/publicservices/systems_planning/energy/Pages/EnergyFund.aspx.
- Austin Energy. 2012. “Energy Efficiency.” <http://www.austinenergy.com/Energy%20Efficiency/index.htm>.
- Babylon Project. 2009. “The Babylon Project.” <http://www.thebabylonproject.org/>.
- Barnes, Glenn, Nate Geisler and Rich Deming. 2011. “Best Practices for Establishing Municipal Funds for Energy Efficiency Projects.” U.S. Department of Energy Technical Assistance Program. <http://www1.eere.energy.gov/wip/solutioncenter/pdfs/bestpracticesforestablishingmunicipalfundforenergyefficiencyprojects.pdf>.
- Bellis, Elizabeth. 2012a. “Energy Programs Consortium Memorandum—Re: QECBs.” Washington, D.C.: Energy Programs Consortium. <http://www.energyprograms.org/wp-content/uploads/2012/03/QECB-Memo-2-6-12.pdf>.
- Bellis, Elizabeth. 2012b. “Update on WHEEL: The Warehouse for Energy Efficiency Loans.” <http://energyoutlook.naseo.org/presentations/Bellis-WHEEL.pdf>.
- [Berkeley] City of Berkeley, Office of Energy and Sustainable Development. 2008. “Residential Energy Conservation Ordinance.” <http://www.ci.berkeley.ca.us/ContentDisplay.aspx?id=16030>.
- . 2011. “Commercial Energy Conservation Ordinance.” <http://www.ci.berkeley.ca.us/ContentDisplay.aspx?id=15474>.

- Bolten, Amy. 2012. "Sonoma County's SEU Financing Model." *Sustainable Energy as an Infrastructure Investment: The SEU Model*. Webinar. Washington, D.C.: Applied Solutions. <http://www.appliedsolutions.org/content/sustainable-energy-infrastructure-investment-seu-model>.
- [Boulder] City of Boulder. 2011. "Climate Action Plan Tax." http://www.bouldercolorado.gov/index.php?option=com_content&task=view&id=7698&Itemid=2844.
- . 2012. "The Election Is Over. So What's Happening with Boulder's Energy Future?" http://www.bouldercolorado.gov/index.php?option=com_content&view=article&id=16102&Itemid=4943.
- Black, Sarah, Shruti Vaidyanathan, and Michael Sciortino. 2009. *Energy Efficiency Program Options for Local Governments under the 2009 American Recovery and Reinvestment Act*. Washington, D.C.: American Council for an Energy-Efficient Economy. <http://www.aceee.org/research-report/e09x>.
- Busche, Sarah. 2010. *Clean Energy Policy Analyses: Analysis of the Status and Impact of Clean Energy Policies at the Local Level*. Golden, Colo.: National Renewable Energy Laboratory. http://www.nrel.gov/applying_technologies/state_local_activities/pdfs/49720.pdf.
- Byrd, Daniel J. and Richard S. Cohen. 2011. "A Roadmap to Energy Efficiency Loan Financing." Progressive Energy Group, LLC. Memorandum to U.S. Department of Energy. <http://www.cleanenergyfinancecenter.org/wp-content/uploads/DOE-Energy-Efficiency-Report-rev-8-29-11.pdf>.
- [CEC] Commission for Environmental Cooperation. 2010. "Case Studies on Municipal Energy Initiatives." http://www.cec.org/municipalenergy/docs/QA0945-Municipal-Case-Studies_en.pdf.
- [CESI] Clean Energy Solutions, Inc. 2010a. "Best Practices in Community Energy Efficiency Programs: Local Energy Alliance Organizational Structure." *Our Insights: Local Energy Alliance Framework*. Cambridge, Mass.: Clean Energy Solutions, Inc. <http://cleanenergysol.com/insights>.
- . 2010b. "Sustainable Revenue Sources for Local Energy Alliances." http://ces1.squarespace.com/storage/Best_Prac_LEA_Revenues_9-05-101.ppt.
- Chant, Elizabeth (Vermont Energy Investment Corporation). 2012. Personal correspondence. April 25.
- [Chula Vista] City of Chula Vista, California. 2011. "SDG&E Local Government Partnership." Accessed 24 February 2012. <http://www.chulavistaca.gov/clean/conservation/Climate/Energy.asp>.

- ClimateSmart. 2012. "ClimateSmart Loan Program." Accessed March 27.
<http://www.climatesmartloanprogram.org>.
- Clymer, Jennifer, Philip LaMay, Christian Williss and Sharon Procopio. 2011a. "Partnering with Utilities Part 1: Successful Partnerships and Lessons from the Field." Webinar for *DOE Technical Assistance Program*.
<http://www1.eere.energy.gov/wip/solutioncenter/pdfs/partneringwithutilitiespart1successfulpartnershipsandlessonsfromthefield.pdf>.
- Clymer, Jennifer, Neal De Snoo, Dan Schoenholz, Catherine Squire, Gina Blus, Jon Ippel and Cameron Saulsby. 2011b. "Partnering with Utilities Part 2—Advanced Topics for Local Governments in Creating Successful Partnerships with Utilities to Deliver Energy Efficiency Programs." Webinar for *DOE Technical Assistance Program*.
<http://www1.eere.energy.gov/wip/solutioncenter/pdfs/partneringwithutilitiespart2advancedtopicsforlocalgovernments.pdf>.
- [CPUC] California Public Utilities Commission. 2010. "Fact Sheet: Energy Efficiency Government Partnership Programs (2010-2012)." <http://www.cpuc.ca.gov/NR/rdonlyres/E29398ED-75C5-406E-AAA4-350C49284ACD/0/EE5GovernmentPartnershipProgram0710.pdf>.
- . 2012. "Proposed Decision of Alj Farra. Decision Providing Guidance on 2013-2014 Energy Efficiency Portfolios and 2012 Marketing, Education, and Outreach."
<http://docs.cpuc.ca.gov/efile/PD/162141.pdf>.
- Dayton, David (Clean Energy Solutions, Inc.). 2012. Personal correspondence. May 2.
- [DC SEU] District of Columbia Sustainable Energy Utility. 2012. *Quarterly Report for Fiscal Year 2012: First Quarter: October 1, 2011—December 31, 2012*.
<http://ddoe.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/Q1-12-DCSEU.pdf>.
- [DOE] U.S. Department of Energy. 2010. *Clean Energy Finance Guide for Residential and Commercial Building Improvements*. http://www4.eere.energy.gov/wip/solutioncenter/finance_guide/.
- . 2011a. "Sample Business Plan Frameworks." *Better Buildings Neighborhood Program Workshop: The Business of Energy Efficiency*.
http://www1.eere.energy.gov/buildings/betterbuildings/neighborhoods/pdfs/sample_business_plan_framework.pdf.
- . 2011b. "State and Municipal Revolving Loan Funds." *Solution Center*. Updated 17 March 2011.
<http://www1.eere.energy.gov/wip/solutioncenter/financialproducts/RevolvingLoanFunds.html>.
- . 2012. "Resource Directory." *Better Buildings Neighborhood Program*. Accessed March 7.
http://www1.eere.energy.gov/buildings/betterbuildings/neighborhoods/resource_directory.html.

- [DowntownDC] DowntownDC Business Improvement District. 2011. "DowntownDC ecoDistrict: A 21st Century Sustainability Framework." *Downtown Leadership Paper*. Number 8. April 2011. <http://www.downtowndc.org/files/docs/leadershipgreening2.pdf>.
- DTE Energy Company. 2011. "Energy Optimization Credits—EOCs / White Tags®." <http://www.dteenergy.com/businessCustomers/saveEnergy/pilotPrograms/eoCredits.html>.
- [EECI] Energy Efficient Cities Initiative. 2011. "Ann Arbor, Michigan (USA)—Municipal Energy Efficiency Fund" *Good Practices in City Energy Efficiency*. Energy Sector Management Assistance Program. <http://www.esmap.org/esmap/sites/esmap.org/files/Ann%20Arbor%20EE%20Fund%20final.pdf>.
- Efficiency Smart. 2012. "About Us." Accessed March 28. http://www.energysmart.org/About_Us.aspx.
- EnergySmart. 2012. "EnergySmart loan program." Accessed March 27. <http://www.energysmartyes.com/loan>.
- [EPA] United States Environmental Protection Agency. 1994. "A State and Local Government Guide to Environmental Program Funding Alternatives." 841-K-94-001. http://water.epa.gov/polwaste/nps/1994_funding_alts_pub.cfm.
- . 2005. *State Set-Aside Programs for Energy Efficiency and Renewable Energy Projects Under the NOx Budget Trading Program: A Review of Programs in Indiana, Maryland, Massachusetts, Missouri, New Jersey, New York, and Ohio*. http://www.epa.gov/statelocalclimate/documents/pdf/eere_rpt.pdf.
- . 2008. *Advancing State Clean Energy Funds: Options for Administration and Funding*. http://www.epa.gov/statelocalclimate/documents/pdf/clean_energy_fund_manual.pdf.
- . 2011a. *Clean Energy Financing Programs: A Decision Guide for States and Communities*. <http://epa.gov/statelocalclimate/documents/pdf/FinancingProgramsResourceGuide.pdf>.
- . 2011b. *Energy Efficiency in Local Government Operations: A Guide to Developing and Implementing Greenhouse Gas Reduction Programs*. http://www.epa.gov/statelocalclimate/documents/pdf/ee_municipal_operations.pdf.
- . 2011c. *Transportation Control Measures: An Information Document for Developing and Implementing Emissions Reductions Programs*. <http://www.epa.gov/otaq/stateresources/policy/430r09040.pdf>.
- [ESC] Energy Services Coalition. 2010. *Self-Funded Energy Savings Performance Contracting Programs*. <http://www1.eere.energy.gov/wip/solutioncenter/pdfs/selffundedespcprograms.pdf>.

- Goldberg, Marshall, Jill K. Cliburn, and Jason Coughlin. 2011. *Economic Impacts from the Boulder County, Colorado, ClimateSmart Loan Program: Using Property-Assessed Clean Energy (PACE) Financing*. Golden, Colo.: National Renewable Energy Laboratory. <http://www.nrel.gov/docs/fy11osti/52231.pdf>.
- Gottstein, Meg and Lisa Schwartz. 2010. *The Role of Forward Capacity Markets in Increasing Demand-Side and Other Low-Carbon Resources: Experience and Prospects*. Montpelier, Vt.: The Regulatory Assistance Project. www.raponline.org/document/download/id/91.
- Green for All. 2010. *Clean Energy Works Portland: A National Model for Energy-Efficiency Retrofits*. www.greenforall.org/resources/clean-energy-works-portland-report/download.
- [Greenprint] Greenprint Denver. 2007. “Year One Progress Report, July 2007.” City and County of Denver. <http://www.greenprintdenver.org/docs/2007GPDProgressReport.pdf>.
- Haines, Chelsea and Eric Mackres. 2011. “Berkeley, California Residential Energy Conservation Ordinance (RECO).” <http://aceee.org/sector/local-policy/case-studies/berkeley-california-residential-energ>.
- Hayes, Sara, Steven Nadel, Chris Granda, and Kathryn Hottel. 2011. *What Have We Learned from Energy Efficiency Financing Programs?* Washington, D.C.: American Council for an Energy-Efficient Economy. <http://www.aceee.org/research-report/u115>.
- Hayes, Sara and Rachel Young. 2012. *Energy Efficiency: The Slip Switch to a New Track Toward Compliance with Federal Air Regulations*. Washington, D.C.: American Council for an Energy-Efficient Economy. <http://www.aceee.org/research-report/e122>.
- Hardy, Gregg, Jeffrey Swofford, Tyler Dillavou, and Noah Horowitz. 2011. “Better Viewing, Lower Energy Bills, and Less Pollution: Improving the Efficiency of Television Set-Top Boxes.” *Energy Facts*. Natural Resources Defense Council. <http://www.nrdc.org/energy/files/settopboxes.pdf>.
- [ICLEI] ICLEI—Local Governments for Sustainability USA. 2009. “Long Island Green Homes Program in Babylon, New York.” http://www.townofbabylon.com/uploads/pdffiles/CaseStudy_BabylonNYGreenHomes.pdf.
- . 2011a. “Fact Sheet: How 38 Local Governments Fund Sustainability Staff and Operations.” http://www.icleiusa.org/library/documents/ICLEI_Sustainability_Funding_Fact_Sheet.pdf.
- . 2011b. “Inside Montgomery County’s Historic Carbon Tax.” <http://www.icleiusa.org/blog/archive/2011/02/01/inside-montgomery-county2019s-historic-carbon-tax>.
- [ILSR] Institute for Local Self-Reliance. 2009. “Municipal Financing for Energy Efficiency Improvements—Babylon, NY.” <http://www.ilsr.org/rule/2850-2/>.

- [ISO-NE] ISO-New England. 2012. "FCM Calendars and Auction Results." Accessed April 26. http://www.iso-ne.com/markets/othrmkts_data/fcm/cal_results/index.html.
- Kats, Greg, Aaron Menkin, Jeremy Domm and Matthew DeBold. 2012. *Energy Efficiency Financing – Models and Strategies: Pathways to scaling energy efficiency financing from \$20 billion to \$150 billion annually*. Washington, D.C.: Captial E. http://www.cap-e.com/Capital-E/Capital-E_files/Energy_Efficiency_Financing-Models_and%20Strategies.pdf.
- [LBNL] Lawrence Berkeley National Laboratory. 2011. *Using Qualified Energy Conservation Bonds (QECCBs) to Fund a Residential Energy Efficiency Loan Program: Case Study on Saint Louis County, MO*. http://eetd.lbl.gov/ea/emp/reports/ee-policybrief_062011.pdf.
- [LBNL et al.] Renewable Funding, Clinton Climate Initiative, Lawrence Berkeley National Laboratory. 2011. *Property Assessed Clean Energy (PACE) Financing: Update on Commercial Program*. <http://eetd.lbl.gov/ea/emp/reports/pace-pb-032311.pdf>.
- [LGC] Local Government Commission. Undated a. "Energy Managers." *Local Government Energy Efficiency Best Practices: Energy Program Sustainability*. http://www.lgc.org/freepub/docs/energy/case_studies/EnergyManagers.pdf.
- . Undated b. "Revolving Energy Fund & Municipal Utility Surcharge." *Local Government Energy Efficiency Best Practices: Financing*. http://lgc.org/freepub/docs/energy/case_studies/AC_Fund.pdf.
- . Undated c. "San José Energy Fund." *Local Government Energy Efficiency Best Practices: Financing*. http://lgc.org/freepub/docs/energy/case_studies/SanJose_EnergyFund.pdf.
- [LIGH] Long Island Green Homes. 2012. <http://ligreenhomes.com/>.
- Lin, Diana (National Association of State Energy Officials). 2012. Personal correspondence. April 11.
- Livingston, Ann and Susie Strife. 2010 "Boulder County's ClimateSmart Loan Program: Funding Energy Efficiency and Renewable Energy on a Countywide Scale." *Proceedings of the 2010 ACEEE Summer Study on Energy Efficiency in Buildings*.
- Loper, Joe, Steve Capanna, Rodney Sobin and Tom Simchak. 2010. *Energy Savings Credits: Are Potential Benefits Being Realized?* Washington, D.C.: Alliance to Save Energy. http://ase.org/sites/default/files/energy_savings_credits_0.pdf.
- Mackres, Eric, Elena Alschuler, Amy Stitely and Erin Brandt. 2012. *The Role of Local Governments and Community Organizations as Energy Efficiency Implementation Partners: Case Studies and a Review of Trends*. Washington, D.C.: American Council for an Energy-Efficient Economy. <http://aceee.org/white-paper/the-role-of-local-actors>.

- Mackres, Eric and Borna Kazerooni. 2012. *Local Energy Planning in Practice: A Review of Recent Experiences*. Washington, D.C.: American Council for an Energy-Efficient Economy.
- [MaineHousing] Maine State Housing Authority. 2012. "Carbon Quantification Project." Accessed April 18. <http://www.mainehousing.org/ABOUT/ABOUTGreen/Carbon>.
- Marshall, Shawn E. 2010. *Forming a National Community Choice Aggregation Network: Feasibility, Findings and Recommendations*. Galvin Electricity Initiative. http://www.galvinpower.org/sites/default/files/Community_Choice_Aggregation_Report_Final_1-4-11.pdf.
- [Massachusetts] Commonwealth of Massachusetts. 2012. "Green Communities Designation and Grant Program." <http://www.mass.gov/eea/energy-utilities-clean-tech/green-communities/gc-grant-program/>.
- [Mayors] United States Conference of Mayors. 2011. "Clean Energy Solutions for America's Cities." <http://usmayors.org/cleanenergy/report.pdf>.
- Molina, Maggie, Suzanne Watson, Nate Kaufman, Skip Laitner, Eric Mackres, Dan Trombley, Dan York, Marca Hagenstad, Stuart Schare, Dan Violette, Amelia Gulkis, Craig Metz, and Gary Gawor. 2011. *Missouri's Energy Efficiency Potential: Opportunities for Economic Growth and Energy Sustainability*. Research Report E114. Washington, D.C.: American Council for an Energy-Efficient Economy. <http://aceee.org/research-report/e114>.
- Morgan, Steve (Clean Energy Solutions, Inc.). 2012. Personal correspondence. April 16.
- Morrill, John, Joan Kelsch, and William Roper. 2008. "Making Fresh AIRE Out of Thin Air: Launching a Local Climate Action Initiative with Minimal State and Utility Involvement." In *Proceedings of the 2008 ACEEE Summer Study on Energy Efficiency in Buildings*. <http://aceee.org/proceedings-paper/ss08/panel11/paper17>.
- [NASEO] National Association of State Energy Officials. 2012. "State Financing Energy Resources: Qualified Energy Conservation Bond (QECB)." Accessed March 27. <http://naseo.org/resources/financing/qecb/index.html>.
- [NOPEC] Northeast Ohio Public Energy Council, Inc. 2012. "Powering Our Communities Grant Guidelines." Accessed April 18. <http://nopecinfo.org/grants/guidelines.html>.
- Pennsylvania Treasury. 2010. "Keystone HELP (Home Energy Loan Program): Proposal to Sell \$25 Million Residential Energy Efficiency Loans." www.iscvt.org/resources/documents/krasja_presentation.ppt.
- Peters-Stanley, Molly, Katherine Hamilton, Thomas Marcello, and Milo Sjardin. 2011. *Back to the Future: State of the Voluntary Carbon Markets 2011*. Washington, D.C. and New York, N.Y.:

Ecosystem Marketplace & Bloomberg New Energy Finance. http://www.forest-trends.org/publication_details.php?publicationID=2828.

[Pittsburgh] City of Pittsburgh. 2008. "Mayor Creates Green Trust Fund." <http://www.pittsburghpa.gov/mayor/article.htm?id=196>.

[PSI] Portland Sustainability Institute. 2011. *Financing an EcoDistrict: Organization Through Project Development and Monitoring*. Portland, Ore.: Portland Sustainability Institute. http://www.pdxinstitute.org/images/posi_publications/Toolkits/5_toolkit_financing_an_ecodistrict_v_1.1_final.pdf.

———. 2012. "EcoDistricts: Building Blocks of Sustainable Cities." Accessed February 21. <http://www.pdxinstitute.org/index.php/ecodistricts>.

[RAEL] Fuller, Merrian C., Cathy Kunkel, and Daniel M. Kammen. 2009. *Guide to Energy Efficiency & Renewable Energy Financing Districts For Local Governments*. Berkeley, Calif.: Renewable and Appropriate Energy Laboratory, University of California, Berkeley. <http://rael.berkeley.edu/sites/default/files/old-site-files/berkeleysolar/HowTo.pdf>.

[RGGI] Regional Greenhouse Gas Initiative. 2012. "Energy Efficiency" Accessed 27 February 2012. <http://rggi.org/market/offsets/categories/efficiency>.

Sciortino, Michael. 2011. "How States Enable Local Governments to Advance Energy Efficiency." Washington, D.C.: American Council for an Energy-Efficient Economy. <http://aceee.org/white-paper/state-enabling-local-ee>.

Seattle 2030 District. 2012. "About Seattle 2030 District." <http://www.2030district.org/seattle/about>.

[Seattle] City of Seattle 2011a. "Seattle Transportation Benefit District." <http://www.seattle.gov/stbd/>.

———. 2011b. "Commercial Parking Tax." <http://www.seattle.gov/rca/taxes/CommParkingTax.htm>.

[SEI] Sustainable Endowments Institute. 2011. *Greening the Bottom Line: The Trend toward Green Revolving Funds on Campus*. Cambridge, Mass.: Sustainable Endowments Institute. <http://www.greeningthebottomline.org/>.

Sonoma County. 2012. Sonoma County's Energy Independence Program. <http://www.sonomacountyenergy.org/>.

Stitely, Amy, Chelsea Haines and Eric Mackres. 2011. "Case Study—Chicago Area Energy Savers Program." Washington, D.C.: American Council for an Energy-Efficient Economy. <http://aceee.org/sector/local-policy/case-studies/chicago-area-energy-savers-program>.

Appendix A: Case Studies

The following is a collection of short case studies that describe the funding mechanisms of specific programs in more detail. While not all of the programs featured here can be described as fully sustainable, each one is executing one or more of the sustainable funding mechanisms described in this report.

ANN ARBOR, MICHIGAN—MUNICIPAL ENERGY FUND

Seed funds: Extension of a bond repayment line item from the general fund

Sustainable funds: Investment of energy cost savings in a revolving loan fund

Use of funds: Improve efficiency of government operations, demonstration and education, energy information

Ann Arbor, Michigan's Municipal Energy Fund provides an example of a program with no upfront cost to local departments that is funded from a capital pool. A revolving loan fund was originally capitalized starting in 1998 by extending the annual budget line item for repayment of an energy-related bond for six years beyond the payoff of the bond, providing a total of \$600,000 in direct investment into the fund. These funds are invested in energy efficiency projects across city departments. Eighty percent of the estimated resulting energy cost savings are used to make annual payments back into the Energy Fund and the remaining 20% is kept by the department for the first five years. At least 70% of investments must have a payback period of five years or less to ensure the fund is completely reimbursed and has enough revenue to regularly make new investments. Up to 20% of funds can be used for demonstration and education projects and up to 10% can be used to produce information, such as energy audits, for facility managers (Ann Arbor 2012). As a result of this financial arrangement the fund is self-sustaining while still able to be used for innovative, longer payback projects. As of 2011, the Energy Fund had invested \$600,000 in energy projects and achieved a cumulative energy cost savings of \$1.5 million and energy savings of 10.7 GWh (Barnes, Geisler and Deming 2011; EECI 2011).

ARLINGTON COUNTY, VIRGINIA—ARLINGTON INITIATIVE TO REDUCE EMISSIONS (AIRE)

Seed funds: General funds

Sustainable funds: Tax on residential utility energy consumption

Use of funds: Municipal building improvements, staffing, technical assistance, energy planning

The Arlington Initiative to Reduce Emissions (AIRE) was launched in 2007, with the goal of reducing greenhouse gas emissions from county government operations to 10% below 2000 levels by 2012, including through reducing energy use by 2% per year from 2007 to 2012 with energy efficiency retrofits. The effort focuses primarily on county operations, including purchasing clean energy and increasing the efficiency of buildings, vehicles, and other infrastructure, such as traffic signals and street lights (Morrill et al. 2008). The county is also preparing a Community Energy Plan, which

doubles as a climate action plan by using greenhouse gas emissions as a proxy for overall energy productivity. The Arlington Green Games, a program launched in October 2010 within AIRE, provides assistance and recognition to businesses pursuing energy and water use reductions.

The Department of Environmental Services (DES) in the county government manages AIRE and the Green Games. The efforts are now funded by a dedicated residential utility tax. Capped at \$72 per household per year and designed to avoid adversely harming low-income households, the tax generates approximately \$1.5 million per year for the AIRE program. These funds support retrofits in public buildings and pay for eight full-time staff that lead sustainability efforts for the government and community, as well as program costs associated with the effort. (This case study was adapted from ACEEE 2011b.)

BABYLON, NEW YORK—LONG ISLAND GREEN HOMES PROGRAM

Seed funds: Municipal Solid Waste Reserve Fund

Sustainable funds: Participant fee for energy service, revolving loan fund

Use of funds: Residential energy upgrades and program administration

In 2008, the Town of Babylon on Long Island approved the Long Island Green Homes (LIGH) Program. This program was intended to expand the community's leadership on energy efficiency for new construction (including requirements for ENERGY STAR for new home construction and LEED Certified for all new commercial and industrial buildings) into addressing existing homes. The program aimed to provide up to \$12,000 per home for energy efficiency improvements that would be repaid over time by the homeowner (or subsequent homeowner) through a monthly benefit assessment fee included on municipal garbage collection bills. The fee payments are structured to be less than the energy bill savings from the improvements (ILSR 2009).

The start-up funds for the program were drawn from a surplus in the town's \$25 million Solid Waste Reserve Fund, a fund required of the town by the state in order to pay for disposal of the byproducts from a Covanta energy-from-waste facility located in the town. The town expanded its definition of solid waste—and as a result the potential uses of the fund—to include the carbon emissions resulting from energy use. The \$2 million allocation from the solid waste fund was designated to be used as a revolving loan fund to pay for residential energy improvements made through the LIGH program (ICLEI 2009). In addition, the town charges a 3% administration fee to participants to cover the cost of running the program in order to not deplete the revolving loan fund. As a result, the LIGH program fund is self-sustaining at little cost to homeowners and no direct cost to taxpayers. As of December 2011, LIGH and its revolving loan fund have completed energy improvements for 600 homes, or 1% of all homes in the community (LIGH 2012). The success of the program has led some of its champions to start the Babylon Project, an organization dedicated to replicating the successes of LIGH in other communities (Babylon Project 2009).

BERKELEY, CALIFORNIA—ENERGY CONSERVATION ORDINANCES

Seed funds: General funds for development of the policy

Sustainable funds: Participant fees, general fund allocation

Use of funds: Implementation of mandatory efficiency standards for existing buildings

The city of Berkeley has had a Residential Energy Conservation Ordinance (RECO) in place since 1987 and a Commercial Energy Conservation Ordinance (CECO) in place since 1994. The ordinances require that minimum energy and water efficiency measures be installed in all buildings—new or existing—at time of sale, transfer, or renovation. The costs of installing the measures is the responsibility of the building owner. The city enforces the ordinances through its regular building inspection process run through the Building and Safety Division. A nonprofit organization, the Community Energy Services Corporation (CESC), is responsible for compliance audits (Berkeley 2008, 2011).

Implementing the policy imposes little or no cost to taxpayers. Staff time is the sole operating cost of the policy. Audit costs are covered by a flat \$100 fee. Most other implementation costs (mainly 10-15% of time from a staff person from the Building and Safety Division devoted to correspondence with building owners, recording compliance, etc.) are covered by a \$20 form filing fee. The Energy Efficiency Coordinator, responsible for overseeing the program with 5% of her time, is paid for out of a separate budget (Haines and Mackres 2011). As a result, nearly all costs of this energy-saving policy are passed on directly to building owners. Additionally, the funding for the program is self-sustaining because the amount of funding brought in through the fees is directly proportional to the number of buildings filing for compliance and related staff time requirements.

BOULDER COUNTY, COLORADO—CLIMATESMART LOAN PROGRAM

Seed funds: Municipal bonds, Qualified Energy Conservation Bonds (QECCB)

Sustainable funds: Payments on Property Assessed Clean Energy loan obligations, program fees

Use of funds: Energy improvements to existing commercial and residential buildings

Using funding from a dedicated \$40 million tax-exempt bond measure approved by county voters in 2008, this program finances energy efficiency and renewable energy investments for existing residential and commercial buildings. The commercial component of the program is also funded by \$1.575 million in Qualified Energy Conservation Bonds issued in November 2010 (NASEO 2012). Loans are repaid through a PACE mechanism: assessments on the property tax bill that are transferred along with the property. The program's administrative costs are covered by a \$75 application fee and approximately 4% in fees added to the principal of loans (Livingston and Strife 2010). Future capital investments made by the program will require additional bonds issuances once the initial bond financed amount is loaned out. An analysis of the residential portion of the program determined that \$9 million worth of the project investments resulted in 126 short term jobs, \$7

million in additional earnings, and \$20 million in additional economic activity for the state (Goldberg et al. 2011).

ClimateSmart is currently suspended due in part to a Federal Housing Finance Agency ruling preventing PACE assessments as senior debt on the majority of mortgages (ClimateSmart 2012). However, Boulder County and the nearby City and County of Denver will soon be launching a traditional, non-PACE loan product through the EnergySmart program (EnergySmart 2012).

CITY OF CHULA VISTA, CA AND SDG&E—LOCAL GOVERNMENT PARTNERSHIP

Seed funds: Program grants from local investor-owned utility mandated by state

Sustainable funds: Program grants from local investor-owned utility mandated by state

Use of funds: Citizen education and outreach, free building evaluations customer financial incentives

One of the most developed utility and local government partnership programs is in California where the 2010-2012 statewide utility efficiency budgets allocated over \$270 million to the Local Government Partnership Program. Most of these funds are available for the retrofit of local government buildings, the promotion of existing utility programs, and activities identified as priorities for local governments by the state's Long Term Energy Efficiency Strategic Plan. One initiative funded through this program is the partnership between the City of Chula Vista and San Diego Gas and Electric. It has a five year budget from the utility of over \$5 million (CPUC 2010). It funds events and public kiosks for energy efficiency education and free building energy evaluations for residential and commercial customers, in addition to existing utility incentives (Chula Vista 2011).

Other programs around the state fund pilot tests of innovative approaches to energy efficiency; access to data, tools and training to help manage community-wide energy use; efficiency measures for hard to reach customers; adoption of policies that exceed state requirements; improving building energy code compliance; implementing systems to track and manage energy use in municipal operations; adoption plans to reduce greenhouse gas emissions through energy efficiency; or capacity building to implement energy efficiency (CPUC 2010). The draft guidance for the 2013-2014 California utility energy efficiency program portfolios suggests that local efficiency programs have been seen as successful overall and are likely to be continued and expanded (CPUC 2012).

DISTRICT OF COLUMBIA—SUSTAINABLE ENERGY UTILITY

Seed funds: Clean and Affordable Energy Act (CAEA) established a surcharge on customer utility bills contributing to the Sustainable Energy Trust Fund (SETF)

Sustainable funds: Surcharge on customer utility bills contributing to the SETF

Use of funds: Customer energy efficiency incentives and technical assistance programs for residential and commercial buildings

Established by the District of Columbia’s Clean and Affordable Energy Act of 2008, the District of Columbia Sustainable Energy Utility (DC SEU) is a third-party administered entity that provides energy efficiency and renewable energy services to residential and commercial customers. DC SEU is tasked by the legislation with achieving a series of energy and non-energy goals. The program is funded by the Sustainable Energy Trust Fund, which is capitalized by per kilowatt-hour and per therm surcharges on customer electric and natural gas utility bills. The DC SEU began operations in 2011, with an initial budget of \$7.5 million; annual funding will increase to a sustained level of \$20 million by the fourth year of operation (Chant 2012). In 2011, DC SEU implemented quick-start, direct installation programs for low-income multifamily housing, small businesses, and single-family residences. For 2012 they are developing a broader suite of programs that will include commercial and institutional, low-income multifamily, and single-family residential buildings, as well as renewable energy (DC SEU 2012).

This model is based in part on the Efficiency Vermont model, which has been in operation since 2000 and is administered by the Vermont Energy Investment Corporation (VEIC). In addition to being partners on DC SEU, VEIC has also been involved with the development of Efficiency Smart, a sustainable energy utility available to customers of over 50 partnering municipal utilities mostly in Ohio (Efficiency Smart 2012). Variations on the SEU model have also been deployed in Delaware. Sonoma County, California is in the process of developing an SEU to serve a variety of public institutions operating within the county (Bolten 2012).

EUGENE, OREGON—ENERGY MANAGEMENT PROGRAM

Seed funds: Intra-governmental loan

Sustainable funds: Departmental facility occupancy charge set at a fixed level

Use of funds: Municipal operations efficiency improvements available to all departments

Eugene, Oregon initially funded its Energy Management Program by borrowing \$2 million from the city’s “Fleet Fund,” which is usually used to purchase government vehicles and equipment, and to fund corresponding maintenance. These funds were used to develop and implement efficiency improvements across city departments. To repay this loan, the city permanently set the “facility occupancy charge,” the amount paid by city departments for energy costs and other maintenance, at their 1995 levels. As actual energy costs decreased because of the energy efficiency measures the departments do not realize the savings, rather the savings are retained by the Facility Management Division to repay the loan. In order to ensure that energy savings accrued quickly enough to repay the loans, a maximum payback period of 10 years was established for energy efficiency investments (CEC 2010). This mechanism is a form of a value capture public finance, which could perhaps be termed “reduced liability capture,” in that it is appropriating future departmental energy cost reductions to finance upfront investments on behalf of all departments.

METROPOLITAN ENERGY CENTER—KANSAS CITY HOME PERFORMANCE WITH ENERGY STAR

Seed funds: Other energy service activities

Sustainable funds: Fee for service contract with electric and gas utilities

Use of funds: Incentives for home energy retrofits and program administration

The Kansas City Home Performance with ENERGY STAR program is administered by the nonprofit Metropolitan Energy Center (MEC). The program is the local variation on the whole-building approach to home energy improvement sponsored nationally by the U.S. Department of Energy and U.S. Environmental Protection Agency. MEC markets the program to homeowners, connects them with certified home energy assessors, and assists homeowners in obtaining up to \$1,200 in rebates in the form of bill credits from the sponsoring utilities, Missouri Gas Energy and Kansas City Power & Light. Customers are permitted to waive their bill credit to the improvement contractor, in which case MEC manages the disbursement of funds to the contractor. MEC oversees the participating contractor network, including processes for a background check, program orientation, necessary training, certification, mentoring, continuing education, and quality assurance.

For its role as administrator of the program MEC receives a fee from the sponsoring utilities. A memorandum of understanding (MOU) between all parties outlines fees paid to MEC for the completion of each step in the program process for each home. These steps include technical analysis of the assessment and work scope, application processing, building owner interaction, funds disbursement, contractor orientation, mentoring, and quality assurance. The term of service for the MOU is designed to be in place for the period of time that the utilities choose to offer the program. Five full-time equivalent positions exist to address management and customer interaction, data processing, technical review, orientation and mentoring, and quality assurance. All of these positions are supported by the MOU fee structure; four are fully funded through it and one is partially funded. As of April 2011, 1,862 projects had been completed under the program with predicted annual savings of 1,800 MWh of electricity and 1 million therms of natural gas for a combined annual savings to homeowners of \$1.2 million (Adams 2011; Molina et al. 2011).

OREGON—CLEAN ENERGY WORKS PORTLAND/CLEAN ENERGY WORKS OREGON

Seed funds: Portland Bureau of Planning and Sustainability, EECBG formula and Better Buildings grants

Sustainable funds: Payments on loans from revolving loan fund including administration fees, allocation of ratepayer funds through Energy Trust of Oregon

Use of funds: Residential home energy retrofits and program administration

Clean Energy Works Oregon (CEWO), formerly Clean Energy Works Portland, offers an on-bill loan program providing long-term, low-interest financing to homeowners for whole-home energy upgrades. The original Portland-only version of the program was a sizable public-private partnership led by the City of Portland Bureau of Planning and Sustainability (BPS). The program established a revolving loan fund that is re-capitalized through customer payments made on energy efficiency loans. BPS served as the leader and convener for the effort, and provided the initial funding for the

pilot program from its formula EECBG grant. Enterprise Cascadia (formerly Shorebank Enterprise Cascadia) is a nonprofit certified community development financial institution (CDFI) that helped establish the loan fund, underwriting criteria, and operating guidelines (Green for All 2010).

The state's energy efficiency and renewable energy fund administrator, Energy Trust of Oregon, provided cash incentives and critical operational support through its program management contractor, Conservation Services Group (CSG). The local utilities, including NW Natural, Pacific Power, and Portland General Electric, established mechanisms to collect funds through heating bills in close collaboration with Energy Trust and Enterprise Cascadia (ACEEE 2011c). Multnomah County, the administrator of Portland's local Community Action Program, helped integrate the pilot with the federally-funded Weatherization Assistance Program. Because of its innovation and early successes, Clean Energy Works Portland attracted \$20 million from U.S. Department of Energy (DOE) under the competitive EECBG program to scale up the pilot into a statewide effort.

SAINT LOUIS COUNTY, MISSOURI—SUSTAINABLE AND VERIFIABLE ENERGY SAVINGS (SAVES)

Seed funds: QECCB bonds and EECBG grants

Sustainable funds: Interest rates on loan payments are designed to cover program administration costs

Use of funds: Residential home energy retrofits, interest rate buydowns, and program administration

The Saint Louis County Sustainable and Verifiable Energy Savings (SAVES) program offers residential loans for home energy upgrades. Loans range from \$2,500-15,000 and the program is funded with \$10.4 million in funds from a QECCB issuance. The program leveraged an additional \$592,000 of EECBG funds to buy down customer interest rates and cover program startup costs. This money is expected to finance approximately 1,400 energy upgrades. Additionally, the program is designed to be partially self-funded: in a variation on a fee for service model, interest rates on the loans are calculated to cover the ongoing administrative costs of the program. Once the first round of loans have been made and the program is established, the county will evaluate long-term funding and financing options (LBNL 2011).

Appendix B: List of all Examples Cited and Sources for Further Information

All examples mentioned in this report are listed in the table below along with one or more citations where further information can be found. Those programs that are featured in a case study in Appendix A are designated with “*Case Study*” in the citation column.

| Location | Program/Funding Source (Partners) | Information Source |
|---------------------------------------|---|-------------------------------------|
| Alameda County, California | Designated Energy Fund | LGC undated b |
| Allegheny County, Pennsylvania | Energy Program for Municipalities (Utility: Duquesne Light Co.; Community: Allegheny County) | Clymer et al. 2011a |
| Ann Arbor, Michigan | Municipal Energy Fund | <i>Case Study</i> |
| Arlington County, Virginia | Utility Tax for Arlington Initiative to Reduce Emissions | <i>Case Study</i> |
| Austin, Texas | Austin Energy (municipal utility) | Austin Energy 2012 |
| Babylon, New York | Long Island Green Homes Program | <i>Case Study</i> |
| Berkeley, California | Administration fee for Commercial and Residential Energy Conservation Ordinances | <i>Case Study</i> |
| City of Boulder, Colorado | Creation of new municipal utility | Boulder 2012 |
| City of Boulder, Colorado | Climate Action Plan Tax on electric bills of residential consumers | Boulder 2011 |
| Boulder County, Colorado | ClimateSmart Loan Program (PACE financing program seeded with funds from municipal bonds and a QECB issuance) | <i>Case Study</i> |
| California | Local Government Partnership Programs (Utilities: Southern California Edison, Pacific Gas & Electric, SoCalGas, and San Diego Gas & Electric; Communities: dozens around the state) | <i>Case Study (Chula Vista, CA)</i> |
| Chapel Hill, North Carolina | Energy Bank | Barnes, Geisler and Deming 2011 |
| Charlottesville, Virginia | Local Energy Alliance Program | Morgan 2012 |
| Chicago area, Illinois | Energy Savers Program | Stitely, Haines and Mackres 2011 |
| Chicago, Illinois | Small Business Improvement Fund | ACEEE 2011a |

| Location | Program/Funding Source (Partners) | Information Source |
|--|---|--------------------------------|
| Cincinnati area, Ohio and Kentucky | Greater Cincinnati Energy Alliance | Morgan 2012 |
| Clackamas County, Oregon | Sustainability Office funded by franchise fees from solid waste and recycling services | ICLEI 2011a |
| Columbia, Missouri | municipal utility | Molina et al. 2011 |
| Denver, Colorado | Municipal DSM Program (Utility: Xcel Energy; Community: City of Denver, CO). | Clymer et al. 2011a |
| District of Columbia | DowntownDC ecoDistrict | DowntownDC 2011 |
| District of Columbia | Sustainable Energy Utility | <i>Case Study</i> |
| Duluth, Minnesota | Energy Management Fund | ICLEI 2011a |
| East Bay (San Francisco Bay Area, California) | East Bay Partnership (Utility: Pacific Gas & Electric; Cities: Berkeley, Fremont) | Clymer et al. 2011b |
| El Paso, Texas | Environmental Fee | ICLEI 2011a |
| Eugene, Oregon | Energy Management Program | <i>Case Study</i> |
| Flagstaff, Arizona | environmental management fee | ICLEI 2011a |
| Kansas Corporation Commission | Facility Conservation Improvement Program (FCIP) | ESC 2010 |
| Kansas City area | Home Performance with ENERGY STAR (Metropolitan Energy Center) | <i>Case Study</i> |
| La Crosse, Wisconsin | Landfill “tip” fees | ICLEI 2011a |
| Long Beach, California | city enterprise funds | LGC undated a |
| Maine | Maine State Housing Authority Carbon Quantification Project | MaineHousing 2012 |
| Massachusetts | Community Mobilization Initiatives (Utilities: NSTAR and National Grid; Communities: Boston Chinatown, Chelsea, Lynn, New Bedford, and Springfield) | Mackres et al. 2012 |
| Massachusetts | Green Communities Program | Massachusetts 2012 |
| Massachusetts | NO _x SIP Call | EPA 2005; Hayes and Young 2012 |
| Michigan | White Tags Program (Sterling Planet and DTE Energy) | DTE Energy Company 2011 |

| Location | Program/Funding Source (Partners) | Information Source |
|---|---|---------------------------------|
| Montgomery County, Maryland | Carbon Excise Tax (later repealed) | ICLEI 2011b |
| New England | ISO-New England Forward Capacity Market | Gottstein and Schwartz 2010 |
| New York state | NYSERDA Green Jobs—Green New York program | Lin 2012 |
| Northeastern U.S. States | Regional Greenhouse Gas Initiative (RGGI) | RGGI 2012 |
| Ohio and region | Efficiency Smart (50 communities with municipal utilities that are members of American Municipal Power, Inc.) | Efficiency Smart 2012 |
| Oregon/ Portland, Oregon | Clean Energy Works Oregon/Portland | <i>Case Study</i> |
| Orlando, Florida | GreenWorks Orlando / Green Neighborhood Program | Clymer et al. 2011b |
| Orlando, Florida | Revolving Energy Fund | Barnes, Geisler and Deming 2011 |
| Pennsylvania | Guaranteed Energy Savings Act (GESA) program | ESC 2010 |
| Pennsylvania | Keystone Home Energy Loan | Pennsylvania Treasury 2010 |
| Pittsburgh | Mayor's Green Initiative Trust Fund | Pittsburgh 2008 |
| Portland, Oregon | funding model | ICLEI 2011a |
| Saint Louis County, Missouri | Sustainable and Verifiable Energy Savings program (SAVES) | <i>Case Study</i> |
| San Jose, California | Energy Fund | LGC undated c |
| San Luis Obispo County, California | Utility Coordinator funder through General Fund | LGC undated a |
| Seattle, Washington | Commercial Parking Tax | Seattle 2011b |
| Seattle, Washington | Seattle 2030 District | Seattle 2030 District 2012 |
| Seattle, Washington | Seattle Transportation Benefit District /vehicle licensing fee | Seattle 2011a |
| Sonoma County, | Energy Independence Program | Sonoma County 2012 |

| Location | Program/Funding Source (Partners) | Information Source |
|-------------------------------------|--|----------------------------------|
| California | | |
| Union County, North Carolina | Revolving Energy Fund | Barnes, Geisler, and Deming 2011 |
| U.S. DOE | Better Buildings Neighborhood Program (over 40 competitively selected state and local governments around the U.S.) | DOE 2012 |
| Washington | State Department of General Administration, Energy Performance Contracting Program | ESC 2010 |