



UNLOCKING DEMAND:

AN ANALYSIS OF STATE ENERGY EFFICIENCY AND
RENEWABLE ENERGY FINANCING PROGRAMS IN
THE BUILDINGS AND INDUSTRIAL SECTORS

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Executive Summary

The 56 State and Territory Energy Offices' investments in energy efficiency and renewable energy projects have grown over three decades, not only through cost-shared support for technology demonstrations and commercialization, but also through a variety of financing programs and mechanisms. Over the past several years, the number and scale of these public-private financing programs have grown; the total estimated investment stands at \$3 billion in 2013, with significant additions expected in the coming year. The types of financing tools used by State Energy Offices have evolved from revolving loan funds to sophisticated credit enhancement mechanisms and new approaches to bond financing. With successful models expanding across the United States, the National Association of State Energy Officials (NASEO) has completed an analysis of state energy financing programs focused on the buildings and industrial sectors to identify and evaluate approaches that have been implemented by State Energy Offices and their public and private partners.

States' early energy efficiency financing efforts, over 30 years ago, were focused largely on the public facilities sector, including state office buildings, universities, and local facilities, such as schools. From these early efforts, financing programs evolved to respond to the unique market needs and opportunities in each state. An important differentiating factor among these programs is the linkage to state energy policy efforts that seek to open new market opportunities and catalyze investments. Today, there are examples of successful state energy efficiency and renewable energy financing programs for every building sector, including residential, commercial, industrial, multifamily, and public facilities. We often see these programs linked to broader economic development efforts.

Analysis and Results

In 2012, NASEO's State Energy Financing Committee and an expert Financing Advisory Group (see Appendix A) were convened to develop criteria (see Appendix B) for use in reviewing the relative success of 21 state energy financing programs. The criteria included qualitative metrics such as the ability to address market barriers, build demand, and maintain momentum through a sustainable programmatic approach. NASEO consolidated each of the state programs' responses and linked them to the criteria in the form of a detailed profile for each of the evaluated programs (available in Appendix C). Utilizing the criteria and resulting data, NASEO completed this analysis report, which discusses major market barriers, success drivers, and models for state-led financing programs across the buildings and industrial sectors. Large-scale energy production and generation projects were not evaluated as a part of this report.

NASEO's analysis reveals a number of key financing program success factors, including the following:

- First, there is no "one size fits all" program design. Successful programs accommodate the need for flexibility for unique classes of program participants, as long as the program goal remains focused on reducing energy consumption and/or increasing renewable energy capacity, while saving money for the end-user and creating economic benefits. Of the 21 programs reviewed, the large majority (18 programs) focus on a single sector, enabling a program design targeted to a specific type of building, industry, or customer. Within this subset, at least threeⁱ have undergone a rigorous pilot phase and/or redesign, enabling program participants to provide feedback and improve the design and implementation at various points. The remaining threeⁱⁱ programs that straddle multiple or all sectors rely heavily on public-private partnerships with banks, trade allies,

ⁱ Including programs in Colorado, Alabama, and South Carolina.

ⁱⁱ Including programs in New York, Connecticut, and Nebraska.

or other entities to create a connection to customers and ensure that the program is designed to suit their needs.

- Second, having worthy energy projects in need of financing, and not financing in search of projects, is an important prerequisite for successful financing programs. The ability to link a state financing program with a larger package of technical services and policies that promote sustained private sector interest and operational sustainability is a primary predictor of success. NASEO's research revealed that in at least eight programsⁱⁱⁱ, the decision to embed the financing offering within a larger package of technical services (for instance, Home Performance with Energy Star, performance contracting, trade ally networks, or other single point-of-contact services that guide program participants through projects) was identified as a key success driver. Simply providing access to large amounts of capital at a competitive or low cost, for example, has not typically resulted in significant demand for financing and projects.
- Third, there is a greater need for financing across all sectors than is currently available, especially for projects deploying high-risk technologies or those with lengthy returns on investment (ROIs)¹. The pool of accessible financing available at attractive interest rates for energy projects *does not* match the opportunity. A number of programs covered in this report address this challenge by incorporating some sort of "exit plan" into their design, enabling the future transition of the program partially or entirely to the private sector, demand permitting. In general, states approach the financing opportunity as a public-private partnership and take steps to evaluate the need for their participation. However, access, as noted above, should be linked to other program and policy actions to ensure economically sustainable success.
- Fourth, most audit, design, installation, commissioning, and lending services in the buildings and industrial sectors are conducted by the private sector; thus market transformation cannot occur without the participation of major players such as Energy Service Companies (ESCOs), engineering consultants, product vendors, commercial real estate firms, and private sector lenders. Some states have achieved significant outcomes by working with strategic partners to support the administration, marketing, and performance tracking of their financing programs. As it is the ultimate goal of many state financing programs to drive marketplace demand without the construct of a government-funded or -subsidized program, public-private partnerships are essential.

As state energy financing transitions to increasingly sophisticated and strategic models, such as the emergence of secondary markets for loans, NASEO's research identified six trends that are likely to facilitate the next wave of state energy efficiency and renewable energy financing programs:

1. Designing a payback structure that creates an attractive return for private sector investors;
2. Achieving a cyclical and/or growing funding stream that allows the program to be a consistent option in the target market as long as opportunity or demand is evident;
3. Designing program structures in such a way as to cover administrative costs;
4. Tapping into funding sources that do not depend on government subsidies;
5. Ensuring that typically underserved segments of the population have access to the program; and
6. Attaining flexibility of program design to allow for supporting strategies and approaches unique to particular states and communities.

Together, the above ideas may usher in new strategies and approaches, particularly as states examine the potential of energy bank structures, secondary markets, commercial Property Assessed Clean Energy (PACE), and innovative on-utility-bill ("on-bill") approaches to overcome longstanding market barriers and

ⁱⁱⁱ Identified in Minnesota, Colorado, Ohio, New York, Vermont, Pennsylvania, Tennessee, and Texas

challenges in increasing cost-effective energy efficiency implementation in the buildings and industrial sectors.

NASEO has developed this report to inform the refinement of approaches and expedite the expansion of state energy financing programs. With at least 44 states and territories operating one or more energy efficiency and renewable energy financing programs, the experience of State Energy Offices can provide critical information and lessons learned as “newcomers” enter particular market sectors and begin to build the best program for their jurisdictions and target market opportunities.

Introduction

The economic opportunity in and environmental imperative for promoting investment in energy efficiency and renewable energy are reaching historic highs. McKinsey and Company estimates that \$520 billion in cost-effective investments would reduce U.S. nontransportation energy usage by 9.1 quadrillion British thermal units (BTUs) by 2020—roughly 23% of projected demand.^{2,iv} As a result, estimates show the U.S. economy would save more than \$1.2 trillion and create approximately 17³ new jobs for every \$1 million invested.

To capture this potential, many states have looked outside of grant funding to financing programs, public-private partnerships, and other innovative alternatives that enable customers to access the amount of capital needed to fund energy efficiency and renewable energy projects. In this fashion, many state programs are establishing a new market for energy efficiency and renewable energy financing within their states, distinctive from traditional financing in two ways.

First, the goal of these state programs is not replace banks. Rather, their aim is to facilitate projects that promote energy savings or growth in renewable energy generation capacity, and deploy these projects at a scale at which they can become cost-competitive with conventional energy. Most successful state energy financing programs are not predicated on the idea that a state government agency can take over the role of a bank; instead, programs are designed to build demand and market interest by improving access to financing for investment-worthy energy projects and create a track record or process for private sector lenders to fulfill this role in time.

Second, state energy financing may differ from conventional financing in its emphasis on addressing major market barriers to energy efficiency and renewable energy investment, such as project complexity or consumer or investor hesitation resulting from lack of information, inexperience with selecting and working with qualified contractors, and the split incentives problem. A lack of robust historical data supporting strong energy efficiency loan performance has resulted in conservative loan pricing (i.e., high interest rates) and tight eligibility requirements from financial institutions. To address these issues, state involvement in energy financing has typically emphasized lower capital costs and demonstrated an appreciation for data collection, quality assurance, and performance tracking—not just for the loans issued, but also for the projects implemented as well as the procedures, contractors, and marketing channels used within the program. Their approach underscores a recognition that providing access to capital that is reasonably priced and demonstrating the value of energy efficiency lending are important components of financing energy efficiency and renewable energy projects.

Even so, establishing a capital pool and financing mechanism alone does not constitute a program and does not guarantee results. As the programs reviewed throughout this report demonstrate, financing is successful when there is demand in the marketplace, when participating in the program is convenient and considerate of participants' time and effort, and when there is robust engagement with the private sector, either through established networks of banks and credit unions, technical experts, utilities, and/or marketing partners. In other words, offering access to lower-cost capital is only one part of successful state financing programs.

^{iv} Additionally, it would avoid the release of some 1.1 gigatons of annual greenhouse gas emissions, an amount equivalent to replacing 1,000 conventional 500-megawatt coal-fired power plants with renewable energy.

About this Report

To explore these and other success drivers, NASEO's State Energy Financing Committee and an expert Advisory Group (see Appendix A) established to guide this report were convened to develop criteria for evaluating state financing programs (see Appendix B), focusing on their ability to achieve energy savings, address market barriers, build demand, and maintain momentum despite political or staff changes. NASEO consolidated each of the state programs' responses reflecting on the criteria in the form of a detailed profile for each of the evaluated programs (see Appendix C). Additionally, the data as a whole revealed a number of important themes offering insights for the development and implementation of effective state financing programs in the future—giving NASEO impetus to develop this paper.

In addition to its coverage of the major financing programs operated by State Energy Offices and their partners, this report describes the range of activities and services that must occur *concurrently* to financing in order to achieve results—not only in terms of energy and cost savings, but also in terms of customer satisfaction, program marketing, operational sustainability, and transition to private sector lenders to the extent practical. Written from the state practitioner's perspective, the report provides detailed profiles of several successful state programs in the context of how they achieve results not only through compelling financing offerings but also through effective program delivery, stakeholder engagement, and quality assurance (see Appendix C).

This report focuses almost exclusively on debt financing that is used to support the installation and operation of fully commercialized energy technologies. Only one of the programs covered herein—Virginia's Commonwealth Energy Fund—offers debt financing that can, under certain circumstances, be converted to equity.

A History of State Financing Innovation

State Energy Offices were initially established in 1973 to support the United States in overcoming the impacts of the oil embargo. Since that time, the scope of their policy and programming activities has expanded to include end-use energy efficiency, renewable energy demonstration and deployment, energy emergency planning and response, statewide energy planning, building energy code implementation and updates, fuels analysis, regional electricity generation and transmission coordination, natural gas end-use development, pollution mitigation, and industrial technology advancement and preservation. Working across state agencies, with local governments, the private sector, and multiple federal agencies, State Energy Offices engage utilities, companies, and citizens in meeting the expectation that our country's energy is produced and utilized in a safe and environmentally sound manner. Today, the State Energy Offices manage and invest more than \$4 billion of appropriations and system benefit charges for energy research, development, demonstration, and deployment each year. These funds are in addition to the financing programs discussed within this report.

State experience in funding energy efficiency and renewable energy projects largely began in 1978 with the establishment of the U.S. Department of Energy's (DOE's) Institutional Conservation Program (ICP), which provided funding to states to offer competitive grants for energy efficiency projects for schools and hospitals. It was through the ICP that the Energy Offices expanded their knowledge about the technical barriers and soft costs associated with energy efficiency projects, as well as the benefits of these projects and their growing demand. In 1996, the ICP was consolidated into the State Energy Program (SEP), which continues to support innovative, public-private approaches to state-led energy efficiency and renewable energy demonstration and deployment.

In the early 1980s, some State Energy Offices opted to initiate energy financing programs to continue making capital accessible for energy projects. Several, including the Nebraska Dollar and Energy Savings Loan Program, took strategic advantage of an influx of petroleum violation escrow (PVE) funds as seed capital for revolving loan funds. States also began accessing private sector capital through a range of strategies that included bond issuances, lease-purchase financing, loan programs, credit enhancements, and collaboration with Energy Service Companies (ESCOs). Importantly, many of these early state-ESCO partnerships evolved to form the now multibillion dollar Energy Savings Performance Contracting (ESPC) industry for public facility modernization in the United States, which includes projects not only in state and local facilities but also in federal government buildings.⁴ Over time, these and other state financing programs have evolved and expanded to cover a greater portion of the market need, transitioned successful program elements to the private sector, refocused on underserved sectors, and taken advantage of additional inflows of private capital. Some of today's State Energy Office financing programs were created through cost-shared U.S. State Energy Program (SEP) funding to enable creation of loan loss reserves, other credit enhancement mechanisms, or revolving loan funds (in these cases, core program financing elements must comply with the federal guidelines associated with SEP).⁵

State Energy Financing Programs: An Overview

The capacity of State Energy Offices and other agencies to undertake a financing program depends on variables both internal and external to their organizational structure and priorities—including legislative and gubernatorial mandates, revenue sources and budget, statutory debt limitations, and relationships among potential stakeholders. These factors vary significantly across state borders, so states must pursue strategies that leverage the characteristics and strengths of their state and region. After over three decades of involvement in financing, State Energy Offices and their partners have piloted and/or implemented a wide range of strategies to spur projects in energy efficiency and renewable energy, resulting in a diversity of implementation partners, target sectors, and major financing mechanisms across the country.

Financing Program Administration and Partnerships

Frequently, state energy financing programs are overseen by the State Energy Office, particularly in jurisdictions where third-party entities (such as banks or other financial institutions) do not provide reasonable financing options for energy projects. The State Energy Offices' expertise in energy technologies, markets, policies, regulation, and programs, make them ideally suited to oversee financing programs in ways that link access to capital to policies, programs, and markets – greatly increasing the relevance of the financing to the private sector and the likely success of the program.

For various reasons, some State Energy Offices partner with other state agencies, private entities, or other nonstate entities to assist them in the actual operation of financing programs. For example, these partner entities may have deeper expertise in working with particular market segments, or have greater bandwidth for financing administration from a personnel or financial resources standpoint. Some states have publicly funded state energy nonprofit organizations that take on the task, while others join with other state agencies and combine financing initiatives to administer the program jointly. Especially in cases where staff is scarce, it may be useful to partner with a third-party or private sector institution to administer or provide additional capital to the program. The value of the partnership ensures that state energy policy linkages and priorities guide the program, ensure evolution as markets and needs change, and provide important oversight and evaluation functions.

These partner entities may include the following:

- *Other State Agencies:* In the public building retrofits sector, nonEnergy Office state agencies, such as the General Services Administration or equivalent, may be equipped to help identify projects and assist municipal and nonprofit building owners in financing and implementing them. For instance, the State of Wisconsin's Energy Bond Fund and Performance Contracting Program is implemented by the Department of Administration (DOA), which enjoys a public facilities fund capitalization of \$200 million and houses the Division of Facilities Development (DFD), involved in building and construction related services. The DOA also houses the State Energy Office in a different part of the agency.
- *Private Sector Administrators:* Private sector activity in state energy financing is burgeoning, with growing numbers of for-profit and nonprofit banks, firms, and consultancies hired to serve as third-party program administrators. In Alabama and Tennessee, the State Energy Offices have contracted with a financial services company and a community development financial institution (CDFI), respectively, to administer their commercial lending programs. In Pennsylvania, the Keystone Home Energy Loan Program (HELP) is supported by the State Treasury and administered by a Pennsylvania lending institution, AFC First. In Michigan, Michigan Saves was established by Public Sector Consultants, a research and program management firm, and the Delta Institute, an economic development organization, through a grant from the Michigan Public Service Commission.
- *Legislatively Enacted Administrators:* In a few cases, specially created entities take the lead on energy financing programs. For example, Efficiency Vermont was created by the state legislature as the nation's first energy efficiency utility. It has carried out energy efficiency programs since its inception in 1999 and has recently added financing to its portfolio.
- *Local Government Administrators:* Local governments have also become engaged in energy efficiency financing for municipal facilities or private sector property owners. Property Assessed Clean Energy (PACE) programs may be operated at the city, county, or state level depending upon enabling legislation, and often require local ordinances to authorize the special assessment. Local and state governments have also made use of Qualified Energy Conservation Bonds (QECCBs) to fund energy efficiency projects, renewable generation, mass commuting facilities, and green community programs.
- *Utilities:* The decision to undertake a certain type of financing program may require that the State Energy Office form specific partnerships. An on-bill repayment or financing program, for example, requires close coordination, support, and participation by local utilities and their regulators. State Energy Office intervention in utility commission proceedings and work with state and local policymakers are frequently key to the creation of these and other utility-focused financing programs.

State Energy Offices and the above-mentioned entities may operate independently in the development and administration of some state financing programs. However, they typically maintain close communications and partnerships to draw on their respective skill sets and expertise. Such relationships may include joint program development; project and/or program reporting structures; and evaluation and oversight.

Major Target Sectors

State energy financing programs are often designed to overcome market barriers and meet the needs of end-users in one or more specific target market segments across the public and private sectors, which are defined in the following list:

- *Institutional (public)*: The institutional buildings market encapsulates a variety of property types, including public housing, publicly-owned office buildings, university and school facilities, hospitals, wastewater treatment plants, and other properties owned and operated by government entities and publicly-funded institutions. Typically, owners of governmental and institutional facilities have access to tax-exempt financing. This sector is sometimes referred to as the “MUSH”^v market.
- *Residential (private)*: The residential sector includes buildings primarily used for housing, such as owned or rented single-family homes, mobile homes, and multifamily housing with fewer than five units.
- *Commercial (private)*: The commercial sector includes commercial properties and large multifamily housing with five or more units. In some instances, commercial properties (such as offices or retail buildings) are tenant-occupied. Within a subset of these buildings, tenants pay the utility bills and will enjoy the benefits of energy efficiency and renewable energy investments directly, while the improvements are paid for by the landlord (a dynamic known as the “split incentive”).
- *Industrial (private)*: Industrial buildings, often manufacturing facilities, typically have the most complex energy-using systems across end-use markets. Energy efficiency measures may take the form of facility improvement, equipment upgrades, and/or process improvements.

Key Approaches and Mechanisms

Our analysis of state energy financing programs revealed eight major mechanisms and approaches being deployed across these four market segments:

1. Bond Issuance
2. Secondary Market Sales
3. Credit Enhancement
4. Energy Infrastructure Banks
5. Energy Savings Performance Contracting (ESPC)
6. On-Bill
7. Property-Assessed Clean Energy (PACE)
8. Revolving Loan Funds

An important part of any state financing program is ensuring that it is tailored to fit the existing market in the state, will meet the needs of the target customers, and serves a financing role that is not fully met by the private sector. There are aspects of each program type described above that can be altered, mixed and matched, or removed in order to ensure the program’s overall success and relevance. For instance, some program models incorporate elements from two or more financing mechanisms into their design (i.e., instance, a revolving loan fund may be used in conjunction with ESPCs to finance projects; PACE financing usually also involves bond issuance and secondary market sales.). A snapshot of state programs that utilize these types of financing mechanisms, and the target sectors, is shown in Exhibit A.

^v “MUSH” is defined to include municipal/state, universities, schools, and hospitals.

Exhibit A. State Financing Programs by Sector and Type of Financing*

Type of Financing	Sector			
	Residential	Commercial	Industrial	Public
Bond Issuance		Oregon State Energy Loan Program		New Mexico Clean Energy Revenue Bond Program
		Florida PACE Funding Agency		Wisconsin Energy Efficiency Revenue Bond Program
	Qualified Energy Conservation Bonds			
Secondary Market	Pennsylvania Keystone HELP	Green Jobs, Green New York On-Bill Recovery Program		Citi-Green Campus Partners Warehouse Funding Facility
	Warehouse for Energy Efficiency Loans	Hawaii Green Infrastructure Bonds Program		
On-Bill	South Carolina Rural Energy Savings Program			
Credit Enhancement	Michigan Saves Home Energy Loan Program	AlabamaSAVES Michigan Saves Business Energy Financing		
Energy Banks	Connecticut Clean Energy Financing and Investment Authority (CEFIA)			Green Bank of Kentucky
Energy Savings Performance Contracting		Colorado Private Sector Energy Performance Contracting Program Pilot		Minnesota Guaranteed Energy Savings Program
Property Assessed Clean Energy	Vermont Junior Lien Residential PACE Program	Florida PACE Funding Agency		
Revolving Loan Funds	Massachusetts Home Energy Assistance Team (HEAT) Loan Program	Tennessee Pathway Lending Commercial Energy Efficiency Loan Program	Ohio Energy Loan Fund	Texas Loan Star Fund for State Facilities
		Virginia Commonwealth Energy Fund		
	Nebraska Dollar and Energy Savings Loan Program			

*Note: Elements of some programs in this matrix may fall under multiple categories.

Bond Financing

Some programs use bond financing to pay for energy efficiency and renewable energy projects. Bonds are debt security, unique from loans in that they are typically easily tradable in the financial marketplace. States have primarily used the following measures:

- *General Obligation (G.O.) Bonds* – Secured by the full faith and credit of the state government and typically repaid from general revenue.
- *Revenue Bonds* – Used for projects generating savings or income (*i.e.*, “revenue”) that can be used to repay the bonds.

Recent years have seen an increasing level of state activity in Qualified Energy Conservation Bonds (QECBs), which are a low-cost, long-term public financing tool for state and local governments to support energy efficiency and renewable energy projects and programs. Under the authorizing legislation, each state receives a formula allocation, which it then suballocates to local governments with populations of at least 100,000. By issuing tax credits or utilizing a direct cash subsidy from the federal government, the bond issuer can effectively buy down the interest rate of the bond. In many states, the responsibility of implementing allocations and coordinating reallocations (should a local government waive its allocation) falls to the State Energy Office.

In partnership with the Energy Programs Consortium (EPC), NASEO has tracked QECB issuances, as well as the challenges and barriers that states and localities are facing in administering QECB programs. NASEO and EPC have also used state input on QECBs to request guidance concerning qualified uses of the bonds from the Department of Energy⁶ and the Internal Revenue Service⁷, with the goal of reducing legal uncertainty and administrative burdens on bond issuers and increasing use of these financing tools.

As of June 2013, at least 131 projects, totaling more than \$775.1 million, have been funded in at least 28 states.⁸ Some states, such as Kansas, Kentucky, Colorado, and Montana, have exhausted or nearly exhausted their entire allocation.

State Energy Office Innovations in Bond Financing Create Energy and Cost Savings

In New Mexico, the Clean Energy Revenue Bond program authorizes up to \$20 million in bond financing to state agencies and public school districts to cut utility bills and reduce energy use. The program provides financing for up-front costs and bond repayments, allowing agencies and schools to devote less money to utilities and more toward their mission. The State Energy Office, the Energy Conservation and Management Division of the Energy, Minerals, and Natural Resources Department (EMNRD), administers the program, and the New Mexico Finance Authority issues and purchases the Clean Energy Revenue Bonds through its Public Project Revolving Fund (PPRF). A unique dimension of the Clean Energy Revenue Bond Program is that the bonds are secured by the State’s Gross Receipts Tax, which enjoys a high credit rating. The state recoups its cost of debt service on the bonds by reducing the agency’s or public school district’s budget. This reduction is equal to or less than 90% of the savings from the energy measures, leaving the remaining 10% with the agency or public school district as an incentive and protective cash flow cushion. This combination of the revolving loan fund with bond financing allows for immediate funding of projects at the low capital cost offered by bonds, and is a model that could be replicated by other states.¹

In Hawaii, the legislature’s May 2013 passage of Senate Bill 1087 authorized an innovative combination of a loan fund, “Green Infrastructure Bonds,” and on-bill repayment to finance clean energy infrastructure, including distributed generation solar photovoltaic (PV) systems. The financing method outlined in this measure would provide a secure financing structure to allow the State Energy Office (the Department of Business, Economic Development, and Tourism (DBEDT)) to issue revenue bonds at very competitive rates and pass these savings on to the consumers in the form of lower borrowing costs. Proceeds from sales of the low-interest, utility tariff-financed Green Infrastructure Bonds to private investors such as pension funds would support a loan fund, enabling Hawaii residents to finance solar PV hosted at their residences or businesses by providing them access to low-cost loans from the loan fund that can be repaid through on-bill repayment on their utility bill.²

1. Interview with Brian Johnson, Energy Conservation and Management Division of the New Mexico Energy, Minerals, and Natural Resources Department, and Zach Dillenback, New Mexico Finance Authority, December 2012.
2. Coalition for Green Capital, “Press Release: Hawaii Announces New Solar Finance Program,” May 3, 2013.

States Achieve Groundbreaking Loan Sales

Since 2006, the Pennsylvania Department of the Treasury and AFC First Financial Corporation have made low-interest loans available through the Keystone Home Energy Loan Program (Keystone HELP), promoting the purchase of high-efficiency furnace and boiler replacements, geothermal heating and cooling units, insulation installations, door and window replacements, and other measures to help Pennsylvania homes conserve energy and reduce utility bills. Since its inception, the program has made almost 11,000 loans for more than \$75 million (and counting) in projects, utilizing a network of 1,700 qualified in-state contractors and service providers. While Keystone HELP loans have benefited from support provided by the Pennsylvania Department of Environmental Protection (the State Energy Office), the Treasury and AFC First soon noticed that as the program gained momentum, demand for Keystone HELP financing was beginning to outpace the available supply of capital. This dynamic created an impetus for Pennsylvania to turn to secondary market capital as a means to continue and expand the program. In March 2013, the Pennsylvania Treasury completed a \$31.3 million loan sale to a consortium of three banks (Fox Chase Bank, WSFS Bank, and National Penn Bank), creating a prototype for future sales of aggregated debt instruments for residential energy efficiency and marking a milestone in the establishment of a secondary market for these types of loans.¹

On the heels of Pennsylvania's move, the New York State Energy Research and Development Authority (NYSERDA), the state energy office, announced in August 2013 the completion of its first-ever issuance of revenue bonds to finance loans for consumers across the State for residential energy efficiency improvements. The Residential Energy Efficiency Financing Revenue Bonds (Series 2013A) were issued for \$24.3 million as Qualified Energy Conservation Bonds (QECBs) and are part of NYSEDA's Green Jobs-Green New York (GJGNY) program, a statewide initiative to promote energy efficiency and the installation of clean technologies to reduce energy costs and greenhouse gas emissions, support sustainable community development, and create opportunities for green jobs. In an innovative effort to ensure the success of the bond sale, the bonds have been rated AAA/Aaa by Standard & Poor's and Moody's, based upon a guarantee from the New York State Environmental Facilities Corporation (EFC) through its State Revolving Fund (SRF) program. The QECBs were sold with an average term of approximately 6.8 years and an average interest rate of approximately 3.21%. Since these bonds provide a federal interest subsidy from the U.S. Treasury, their net interest cost is anticipated at approximately 0.48%.²

1. Interview with Pennsylvania Treasury, and AFC First, January 2013.
2. NYSEDA, "Press Release: NYSEDA Announces Residential Energy Efficiency Financing Bonds through Green Jobs-Green New York," August 2013.

Secondary Market Sales

Financing for energy efficiency projects originates from a variety of sources, including lending institutions such as commercial banks, credit unions, community development financial institutions (CDFIs), and private finance companies, in addition to utilities, government entities, and philanthropic groups. Looking beyond these direct lending options, some programs sell (or plan to sell) energy loan portfolios into the private capital market (where investors purchase previously issued financial assets), enabling them to use proceeds from note sales to capital investors in order to make more loans and potentially offer a lower cost of capital.⁹

Groups like the Energy Programs Consortium (EPC), Renewable Funding, CitiBank, and Ceres have made significant inroads in the development of secondary markets for energy efficiency and renewable energy loans. By engaging lenders, investors, and program administrators, these organizations have examined the barriers associated with bringing these loans to capital markets and are supporting uniformity and transparency in energy efficiency and renewable energy lending. EPC and Renewable Funding, with support from NASEO and others, have been key players in the development of the Warehouse for Energy Efficiency Loans (WHEEL). WHEEL aims to reduce the face value interest rate on unsecured residential energy efficiency loans by supporting the implementation of conforming loan standards that can be used by participating states to make energy efficiency loans, which can be sold into the capital markets at a lower price than is currently being offered by Fannie Mae, the primary secondary market purchaser of these loans.¹⁰ Similarly, the National Renewable Energy Laboratory's (NREL) newly launched Solar Access to Public Capital (SAPC) project promotes the standardization of power purchase and lease contracts used by solar developers, installers, and integrators for commercial and residential uses.¹¹ In November 2013, California-based SolarCity announced the first securitization of rooftop solar assets; its sale of \$54 million in notes is backed by approximately 44 megawatts of residential and commercial installations.¹²

For programs that require loan aggregation and securitization for purposes of a bond issuance, some State Energy Offices have established, or are considering establishing, a line of credit to allow projects to start immediately after approval. This reduces transaction costs by lessening the turnaround time for projects to be approved, financed, and completed.

Using Secondary Market Investment to Streamline MUSH Market Investments¹

In June 2012, Citi's Municipal Securities Division launched a \$50 million warehousing funding facility in partnership with Green Campus Partners (GCP), an energy project development firm serving clients in government and publicly-funded colleges, healthcare, and schools. GCP collaborates with MUSH sector clients, contractors, and energy service companies (ESCOs) to develop and finance energy efficiency, renewable energy, and distributed energy projects. In a typical project, GCP helps its municipal client issue a tax-exempt lease to fund the purchase and installation of energy efficient equipment. ESCOs often provide a guaranteed minimum level of savings that will be achieved upon completion of the project. Upon execution of the lease, upfront capital is provided by long-term investors in exchange for fixed rental payments made over the life of the financing term, typically 12 to 15 years. GCP typically places the lease with long-term investors through a negotiated private offering. The operational savings guaranteed through the energy efficiency measures typically exceed the ongoing lease payments, producing net savings for the issuer with no upfront cost.

The introduction of Citi's warehouse funding facility enables GCP to obtain funding for projects in a more streamlined fashion. Citi offers short-term financing (for a period of up to six months) through their warehouse facility. This allows GCP to originate and fund several projects, and offer a larger portfolio to capital investors once a critical mass has been achieved (rather than approaching investors with projects as they are originated). The Citi-GCP warehouse funding partnership offers an innovative example of how access to credit can streamline project delivery and completion for public sector projects that rely on capital market investment.

As of December 2012, Citi had funded over a dozen leases from issuers across the country totaling over \$55 million. GCP projects a lease origination volume of approximately \$200 million in 2013.

1. Interview with Municipal Securities Division, Citi, December 2012.

Credit Enhancement Mechanisms

Credit enhancement boosts private investors' confidence in investing their capital in energy efficiency and renewable energy projects and/or expands the pool of borrowers who are eligible to access financing. These mechanisms can take various forms, including:

- *Loan Loss Reserves* – A reserve insures a portion of each loan against loss.
- *Interest Rate Buy-Downs* – A state subsidy reduces the interest rate on loans issued by participating lenders. In some cases^{vi}, interest rate buy-downs may be associated with a revenue stream, in which case the state would be making the equivalent of a subordinate loan investment and recoup some of the funds spent buying down the loan.¹³
- *Guarantees* – A state puts its credit behind the loans.

Enhancing Credit in Michigan¹

Michigan's Home Energy Loan Program and Business Energy Financing make credit enhancements available (primarily through a loan loss reserve). The Michigan Energy Office collaborates with the program's administrator, Michigan Saves, as a point of contact in educating the public about Michigan Saves financing offerings

Michigan Saves' approach has had great impact at a low cost by leveraging private capital. The Home Energy Loan Program provides a 5% loan loss reserve, leveraging lender capital at a ratio of 20:1. More than 2,700 homeowners have taken out loans, representing \$22.1 million in investment, and the program now averages \$1 million in loans per month. Similarly, Business Energy Financing has \$5 million in a loan loss reserve, and under the current agreement with Ervin Leasing and Bank of Ann Arbor, the loss reserve funds are leveraged at a 10:1 ratio. More than 30 business owners have taken out leases through the program, representing almost \$1 million in investment since its launch in November 2012.

1. Interview with Michigan Saves, December 2012. Figures updated July 2013.

^{vi} In June 2012, the U.S. Department of Energy issued guidance clarifying an approved use of SEP funds to be an interest rate buy-down associated with a potential revenue stream. See State Energy Program Notice 12-002, https://www1.eere.energy.gov/wip/pdfs/sep_06-04-12.pdf.

Energy Infrastructure Banks

Energy infrastructure banks, also sometimes called “clean energy finance banks,” “green banks,” or “clean energy deployment administrations” (CEDAs), are public financing institutions that support energy efficiency and renewable energy projects and investments by offering a diverse set of financial products and capital, typically at below-commercial rates. They may take the form of a single investment authority under a state’s purview (as with the Clean Energy Finance and Investment Authority in Connecticut), with functions including lending, grant-making, bond authorization, credit enhancement, and other strategic investments.

Some state energy infrastructure banks focus solely on one or two targeted sectors (as with Kentucky’s Green Bank for public facilities), and may not be regulated as banks under standard securities laws. Additionally, based on the wide range of energy financing products and programs they offer, some State Energy Offices manage essentially what amounts to an energy infrastructure bank, but this portfolio of activities may not fall under the singular label of a bank or authority.

Energy Savings Performance Contracting (ESPC)

Many State Energy Offices are experienced managers of energy savings performance contracting (ESPC) projects. ESPC allows public and private entities to enter into a contractual agreement with an energy services company (ESCO) to manage an energy efficiency project, offering a turnkey technical and financing package under which the ESCO is responsible for all tasks associated with the project, including identifying and evaluating energy efficiency measures, designing and implementing the project, and conducting measurement and verification (M&V) for the project. The agency pays for the services of the ESCO with the energy cost savings that accrue from the project. In turn, the ESCO backs the projected energy savings through a performance guarantee, which provides a high level of security for the agency by ensuring that if the projected savings do not materialize, the ESCO is responsible for shortfalls.

According to a database operated by Lawrence Berkeley National Laboratory (LBNL), the ESCO industry achieved revenues of more than \$5 billion per annum in 2011, with high market penetration levels recorded for buildings in the MUSH market (including, in order of penetration level, K-12 schools; state, local, and federal government buildings; universities and colleges; and public housing).¹⁴ The ESPC model offers a convenient approach for program participants by embedding financing into a larger technical package—in short, a one-stop-shop for the full range of issues associated with a project, from providing accurate and clear technical information, to ensuring that equipment operates as represented, to measuring and guaranteeing energy savings.

States Adopting “Green Banks”

Kentucky’s State Energy Office, the Department of Energy Development and Independence, launched the Green Bank for public facilities in 2009 with \$14 million for energy projects at schools and state government buildings. The bank is managed in partnership by the Energy and Environment Cabinet and the Finance and Administration Cabinet. Loans are offered at a 3.25% interest rate over a term of 14 years. The Finance and Administration Cabinet has explored other financing options to expand the program, including use of Build America Bonds and QECBs.¹

In September 2013, the New York State Energy Office (the New York State Energy Research and Development Authority, or NYSERDA) requested the release of \$165 million in ratepayer funds from the New York State Public Service Commission to serve as seed money for the establishment of a \$1 billion Green Bank. The bank, which was announced by Governor Cuomo in his 2013 State of the State address, will be run by NYSERDA, is envisioned to leverage private sector financing and build secondary markets for energy efficiency and renewable energy projects, and is anticipated to be operational in early 2014.²

1. Interview with John Davies and Greg Guess, Kentucky Dept. of Energy Development and Independence, January 2013.
2. Presentation of Jeff Pitkin, NYSERDA Treasurer, to NASEO State Energy Financing Committee, November 2013. <http://naseo.org/Data/Sites/1/documents/committees/financing/notes/2013-11-13-call-notes.pdf>.

ESPC Programs Address Diversity of State Needs and Priorities

Among the largest and longest-running state loan funds in the country, the Texas LoanSTAR (Saving Taxes and Resources) Program uses a revolving loan mechanism to issue loans targeted for public buildings, including state agencies, school districts, higher education, local governments, and hospitals. The program was initiated and is administered by the Texas Energy Office (now the State Energy Conservation Office, or SECO) in 1988 and was approved by the U.S. Department of Energy (DOE) as a statewide energy efficiency demonstration program. It began with \$90 million from petroleum violation escrow (PVE) funds, and added about \$72 million from the American Recovery and Reinvestment Act (ARRA). Loans are offered at attractive interest rates, varying by solicitation and ranging from 2% to 4% depending on current market rates. Three different types of borrower-vendor contracting mechanisms are approved for LoanSTAR financing, including design/bid/build projects, design/build retrofits, and energy saving performance contracting (ESPC), as approved in 2001 by DOE. As of January 2013, LoanSTAR had funded over 233 loans totaling over \$338 million. As a result of these loans, the LoanSTAR Program has achieved total cumulative program energy savings of over \$385 million, which results in direct savings to Texas taxpayers.¹

In April 2011, an Executive Order issued by the Governor initiated Minnesota's creation of the Guaranteed Energy Savings Programs, which offers public entities in the state a Master Contract for ESPCs with a goal of reducing aggregate energy consumption by 20% throughout all state agencies. Under the program, state and local entities can elect to sign a Joint Powers Agreement with the Minnesota Department of Commerce (the State Energy Office) to implement energy efficiency and renewable energy improvements offered by 11 pre-qualified ESCOs. To promote participation in the program, state energy office staff provide technical assistance to ensure the ESPC M&V plan is properly performed and executed, and the Energy Services Coalition Minnesota Chapter's Outreach Committee promotes the program through speaking engagements around the state.²

The Colorado Energy Office (CEO) is working to transfer lessons learned from the state's public sector ESPC program to private sector entities. CEO received an SEP competitive grant in 2011 to introduce select private sector partners to the ESPC process as a means to establish and achieve ambitious energy goals and advance energy projects in their facilities. Selected participants with a utility bill of more than \$100,000 a year enter into a contractual relationship with CEO and receive free project guidance and technical assistance to facilitate project completion. In addition, the participants are eligible for a subsidy of 75% (capped at \$25,000) for a technical energy assessment and will have their successful projects highlighted by the CEO. To date, CEO has accepted 10 businesses to the program. The program is a practical and cost-effective way for CEO to support financing for large energy users in the state.³

1. Interview with Dub Taylor, November 2012. Figures updated January 2013.
2. Interview with Janet Streff and Peter Berger, Minnesota Division of Energy Resources, November 2012
3. Interview with Scott Morrissey, Colorado Energy Office, December 2012.

An important advancement at the state level in the operation of public facility retrofit programs came in 2006 with the advent of statewide best practices for ESPC program design, which resulted from a partnership among the Energy Services Coalition (ESC), National Association of Energy Services Companies (NAESCO), and NASEO. The partners worked with state and local agency end-users and the ESCO industry to establish adoptable goals, contracts, agreements, and processes that would both accelerate investment and protect the agency (and thus the taxpayer) through transparent, sound procurement and marketing practices. The effort also resulted in the creation of a self-funding mechanism to cover the administrative and operating costs incurred by the State Energy Office to guide ESPC implementation and provide technical assistance to end-user state and local agencies. The program adapted many of the country's most successful program elements from states such as Kansas, Washington, and Pennsylvania. This model has spread to many other states over the past six years, such as Minnesota and North Carolina, and is seen as the benchmark program design.¹⁵ In early 2013, NASEO and ESC piloted an ESPC training

Achieving Public Buildings Program Sustainability through the Self-funded ESPC Model

Some states have developed self-funded ESPC programs by incorporating a modest fee into the performance contracting project to be financed and paid for through the guaranteed savings cash flow. Innovative self-funded programs exist in at least three states: Washington, Kansas, and Pennsylvania. The Energy Services Coalition (ESC) has developed web-accessible tools and documents offering technical support to states for self-funded ESPC. For more information, visit www.energyservicescoalition.org.

module (a web-based training course) to educate Energy Office staff on the proven best practices of successful ESPC programs and to analyze and improve program design, in order to continue this forward momentum.

On-Bill Financing, Repayment and Recovery Programs

On-bill mechanisms allow customers to implement energy efficiency measures and pay for the cost of these projects through their monthly utility bills. These loans are made by, or in partnership with, a utility company.

- In on-bill financing programs, the utility finances the cost of the upgrade and the customer repays the investment directly to the utility through a charge on their bill.
- In on-bill repayment and recovery programs, a nonutility entity (such as a financial institution or the state itself) lends to the customer and collects the loan repayment through the utility bill.



Property Assessed Clean Energy (PACE)

Property Assessed Clean Energy (PACE) enables property owners to implement energy improvements on their property and repay the costs over an assigned term (typically between 15 and 20 years) through an annual assessment on their property tax bill. PACE financing is secured with a lien on the property and, depending on the program, the energy financier may be paid either before or after other claims on the property (such as the mortgage) are covered, in the event of foreclosure.

PACE programs can be funded and structured in various ways:

1. In the Warehouse model, an investor (either a government using general funds and/or investment portfolios or a third-party program sponsor using private capital) makes a large line of credit or other credit facility available to cities and counties to use in funding the PACE program. This approach provides immediate funding at a scale that allows for multiple retrofit projects to be developed and financed concurrently. The intent is to fund a critical mass of projects and provide a bridge to longer-term bonds or other securities, which can replenish the line of credit and facilitate a new funding cycle.¹⁶
2. Under the Pooled Bond model, applications for PACE financing are approved by the municipality during an aggregation period. When a sufficient pool of qualified applicants has been collected, the municipality sells a revenue bond to fund the projects at the same time and gives property owners permission to proceed with their proposed upgrades. Some experts note that this model may be better suited for smaller projects (i.e., under \$500,000) because these are normally too small to attract private financing. It can be important in this model to manage the timing of funding with the nonfinancial momentum of viable projects, especially between the property owners and selected contractors.¹⁷
3. In the Open Market model (also known as owner-arranged financing), PACE loans are funded by various financial institutions. The property owner independently negotiates the rates and reserve requirements for the PACE funding needed with a private institution or bondholder. This model allows for modification and customization for a particular property, and affords the property owner flexibility in determining their project, financing, and lender. Financing terms are negotiated independently of the municipality or state, and depend in part on the underlying credit of the owner or building. Some note that this model may be appropriate for larger projects (i.e., more than \$500,000) and/or building

owners with better credit because the financing terms, schedule of performance, and measurement and verification (M&V) of upgrades can be customized on a case-by-case basis.¹⁸

4. A fourth option is the Hybrid model, under which programs combine various features from the above three pathways. Increasingly, the commercial PACE world has seen a stronger shift toward hybrid structures that adapt to local market conditions and political climates.

Since the summer of 2010, secondary mortgage entities Fannie Mae and Freddie Mac have been directed by their regulator, the Federal Housing Financing Agency (FHFA), not to purchase mortgage loans of properties with outstanding first-lien PACE obligations. These moves have frozen much of the residential PACE activity in the United States, with some slowdown observed in the commercial sector as well.

Despite this roadblock, state interest in PACE continues to grow. In fact, in 2013 alone, Arkansas, Colorado, Rhode Island, and Texas signed commercial PACE legislation into law, bringing the number of states with PACE-enabling legislation up to 31.¹⁹ As of November 2013, cities and states have issued over \$43 million to more than 180 commercial PACE projects.²⁰ While the specific legislative language varies, PACE laws allow local municipalities to opt into a PACE program, typically by enacting an ordinance. In many PACE-friendly states, the Energy Office has served as a key partner in the design of PACE laws and program framework, by participating in:

- Educating the governor and/or state legislators on commercial PACE;
- Leveraging financing and assessment authority for commercial PACE programs;
- Specifying the procedures to designate financing districts;
- Authorizing the financing of energy improvements on private property;
- Making the justification that qualified improvements are in the public interest;
- Establishing opt-in assessment features;
- Permitting the use of bonding and loans or grants for financing; and
- Enabling statewide or multijurisdictional programs.

Revolving Loan Funds

Typically, revolving loan funds provide low-interest financing for energy efficiency and renewable energy improvements and are a commonly used state energy financing mechanism because they are relatively uncomplicated in terms of establishment, management, tracking, and reporting. Loan repayments are used to recapitalize the funding pool to enable additional lending and, thereby, revolve the state investment. Revolving loan funds can benefit from credit enhancements such as loan loss reserves or loan guarantees, which can allow the lending entity the ability to lower interest rates for borrowers and/or lend

Vermont's Residential PACE¹

In January 2013, Vermont launched its Residential Property Assessed Clean Energy (PACE) Program, which offers financing for energy efficiency and renewable energy improvements in small (up to four-unit), owner-occupied residential properties through an assessment on their property. Through this program, municipalities are authorized to create and secure debt for the PACE program, if they choose, and to secure funding to pay for energy efficiency and renewable energy projects. While participating property owners pay for the benefit over a period of up to 20 years through a special assessment charged on their property, nonparticipating property owners have no obligation to pay for any of the costs of a PACE district. Those approved receive a fixed-rate loan based on the current market rates, for the life of the assessment. Efficiency Vermont is available to act as the PACE administrator at no cost to the localities, and all costs are paid by participating property owners. The state government maintains a statewide loan loss reserve of five percent up to \$1 million, capitalized by Regional Greenhouse Gas Emissions (RGGI) funds.

To date, 28 towns have signed up to have Efficiency Vermont serve as their PACE Program Administrator. Vermont's PACE legislation underwent significant planning and redesign in order to ensure that it addresses federal, state, and local concerns about PACE financing. For instance, it was designed to mimic the same structure as HUD's PowerSaver program (whereby the lien is junior to the existing mortgage on the property) so as not to run up against the FHFA's ruling prohibiting Fannie Mae and Freddie Mac from purchasing mortgages on properties with PACE liens, allowing the program to thrive.

1. Interview with Peter Adamczyk, Vermont Energy Investment Corporation, December 2012.

to a larger customer base. Either the state itself can act as the lender or the state may delegate functions such as loan origination, underwriting, servicing, customer acquisition, and/or collection to a (or multiple) third-party administrators. For instance, in November 2013 the Washington State Energy Office named nonprofit lenders Craft3 and Puget Sound Cooperative Credit Union to provide financing for energy efficiency and renewable energy through the \$14.5 million Clean Energy Loan Fund.²¹

Revolving Loan Funds in Action in Nebraska¹

One of the longest-standing and highest-volume revolving energy loan programs in the country is the Dollar and Energy Savings Loan Program administered by the Nebraska Energy Office (NEO). This fund, active since 1990, engages more than 265 local lenders and uses a blended interest rate approach to reduce the cost of capital for energy-related projects meeting minimum efficiency standards. NEO purchases 50%, 65%, or 75% of each loan at 0% interest to deliver an interest rate of 5%, 3.5%, or 2.5%, respectively, to the borrower (depending on the portion of the loan the NEO and the bank decide NEO will purchase). This allows the bank to retain a 10% return on its share of the loan, while the portion of the loan purchased by NEO is decided by the rate offered to the borrower by the lender. This approach is a creative way to offer low-interest loans where there is little access to in-house capital.

While the program lends to all four market sectors, the large majority of the projects it finances are for the residential sector. As long as the proposed project appears on NEO's list of pre-qualified measures, the state does not require an energy audit for loan approval. With a total loan pool today of approximately \$38 million, the maximum state contribution to residential loans is \$100,000 for single family and \$250,000 for multifamily. As of June 2013, the program had financed 27,948 projects, totaling \$294 million in financing, achieving a leverage ratio of nearly 7:1.

1. Interview with Ginger Willson and Jack Osterman, Nebraska Energy Office, November 2012. Figures updated June 2013.

Recommendations for Replication

While capital is a barrier for some customers (and, typically, the ultimate impetus for financing programs), it is only one piece of a multistep process that leads to greater investment in energy efficiency and renewable energy. Customers do not often implement energy projects (or even begin to participate in the process) solely because of the availability of financing. Many State Energy Offices and their private sector partners understand this challenge, and have designed and implemented programs that combine financing offerings with marketing, technical, and workforce development strategies to create robust, compelling programs.

As the 44 states and territories operating one or more energy financing programs continue to achieve market impact, there is enough operational experience to identify and highlight key program characteristics that drive success—characteristics which in some cases may directly relate to the financial product offered, but in several other cases are associated with the nonfinancial components of the broader program in which the financing is embedded.

Characteristics of Successful Programs

In order to implement projects at a sufficient scale to take advantage of the immense opportunity in the United States for energy efficiency and renewable energy, the financing for these projects is one piece of a larger puzzle that programs must help piece together—a puzzle that includes generation of consumer demand for projects, ease of program implementation and participation, buy-in from public and private sector partners, and operational sustainability.

Generate Demand for Energy Efficiency and Renewable Energy Projects

Successful state energy financing programs create demand for energy efficiency and renewable energy projects by improving customer awareness of the benefits and potential of energy efficiency and targeting key decision makers. Whatever the marketing or educational delivery method, however, strategies to create demand for a financing offering must overcome challenges that, for the most part, are unique to the energy efficiency market, including complex, lengthy, and often expensive purchasing decisions; potentially confusing technical jargon and concepts; and so-called “small,” “intangible,” or “imperceptible” measures (such as envelope and heating, ventilation, and air conditioning (HVAC) upgrades or the installation of energy management systems).

To overcome these challenges, state energy financing programs can largely benefit from strategic partnerships that build their sales force and enable them to access a larger customer base than they might have alone. For public buildings, many ESPC program leads are driven through the state’s network of pre-approved ESCOs, by informal word-of-mouth marketing among public agencies and organizations with grassroots and state chapters like the ESC and NAESCO. As an additional backstop, many state programs have a point person with the state office to serve as the program promoter, information provider, and trusted resource for all parties and to help coordinate among the various market players, track ESCO activity within the state, and oversee projects for technical and contractual accuracy.²²

Similarly, in the residential sector, partner organizations like the Association of Energy Services Professionals (AESP) have been active in helping State Energy Offices and other agencies participate in marketing partnerships through trusted networks like Trade Ally programs. These networks comprise mutual support structures between programs and trade professionals, who become the outreach arm for the program in return for training, recognition, incentives, sales tools, and technical assistance. Trade allies can serve as critical marketing partners for their ability to offer market knowledge and power; provide a cost-effective and direct route to end-users and program participants; engage and develop the customer base; identify and increase the number of projects; and help create customer satisfaction by delivering projects and relaying customer feedback back into the program.²³

Many programs market through lending partners in order to offer potential program participants a choice of financing provider and to tap into existing relationships between banks and their customers, who may include homeowners, commercial building managers, energy consultants, and manufacturers. Two particularly successful State Energy Office-run programs—Massachusetts’s Home Energy Assistance Team (HEAT) Loan Program and Nebraska’s Dollar and Energy Savings and Loan Programs—have engaged the local banks, credit unions, and CDFIs in their states to create a large network of lending institutions that market, process, and issue their loans, with significant achievements in market penetration, longevity, and leveraging of public funds with private capital.

Strategic Marketing in Oregon

Clean Energy Works Oregon, an alliance among the Energy Trust of Oregon, utilities, financial institutions, localities, and contractors, provides a “one-stop shop” to finance whole-home retrofits. Its strategies rely heavily on co-marketing and co-branding with project partners. The examples, shown below, have been used online, at events, and as direct mail collateral to drive leads through channels and relationships that contracting firms and banks already have in place.¹

1. Clean Energy Works Oregon.

Examples of Clean Energy Works Oregon Direct Marketing

IS THIS YOUR WARM AND HAPPY PLACE?

MAKE YOUR HOME ENERGY CONFIDENT

clean energy works oregon

green home by EcoTech
2630 N Lombard Street, Portland, OR 97227
green@worksbyecotech.com
EEO & M/F D/V

Shocked by your energy bill?

The power is in your hands! Let SELCO and Clean Energy Works Oregon help you turn your home into a comfortable living space with an affordable all-in-one program that provides a free home energy assessment, certified contractors, and local financing. Increasing your home's energy efficiency has never been easier.

It starts with four steps:

- 1 Apply—Submit an application online.
- 2 Assess—Determine energy savings opportunities.
- 3 Finance—SELCO, your local lender, has you covered.
- 4 Transform—Sit back and relax as your home starts saving you more.

If your single-family home was built before 1993, you may be eligible for this program. Clean Energy Works Oregon grants are available to those that qualify, please see SELCO for details. Set started today—visit cwo.org and enter Instant Rebate code: PASEL.

SELCO
COMMUNITY CREDIT UNION
Solutions

selco.org

YOUR DINNER JACKET SHOULDN'T BE INSULATED.

MAKE YOUR HOME A COZY PLACE.

To get comfortable, you've had to get creative. There is no better reason for spending so much on heating bills than the help of Clean Energy Works Oregon. We are energy efficiency gone wild with Energy Trust of Oregon, utilities, certified contractors, and local lenders to make home energy upgrades happen. A free assessment pinpoints energy waste, from your attic to your garage to work. When it's complete, your improvements are guaranteed to verify performance — and your home's overall is insured. Sign up today at cwo.org.

NO MONEY DOWN FINANCING • Instant Rebates up to \$2,000* Only through November 30!

Every Project Independently Inspected

*Maximum rebate amount is \$2,000 per household. Rebates are subject to program rules and availability. See cwo.org for details.

Importantly, utilities can also serve as effective education, marketing, and demand generation vehicles. Whether investor-owned utilities, municipal utilities, cooperatives (or co-ops), or sustainable energy utilities, these entities often offer incentives and programs that can increase awareness of a certain product or improvement and have established lines of communication in place with their consumers (i.e., through the utility bill and direct mail marketing). Additionally, utilities control access to a wealth of data that can be used to inform their customers on potential energy efficiency and renewable energy improvements for their specific property.

South Carolina On-Bill Financing Pilot Leverages Targeted Marketing to Build Demand and Deliver Savings

The Help My House Loan Pilot Program was spearheaded by Central Electric Power Cooperative (Central), the wholesale power provider [Generation and Transmission (G+T) Cooperative] to South Carolina's 20 electric cooperatives and the 1.5 million consumers they serve, and The Electric Cooperatives of South Carolina (ECSC), with technical and policy support from the Environmental and Energy Study Institute (EESI). The pilot provided on-bill financing for energy efficiency measures in 125 homes. The pilot program was designed to finance efficiency upgrades through 10-year, 2.5% interest loans and to examine the impact on individual members, participating co-ops, and wholesale power purchasing. With an average loan size of \$7,684, the pilot achieved impressive results, including average electricity savings of 34% per home and an average payback of 6.6 years.¹

A key strategy undertaken by Carton Donofrio Partners, the marketing firm hired for the pilot, was to co-op members who had higher than average electricity use, because their homes would be the ones most likely to yield a cost-effective project. Some of the co-ops also strategically marketed the pilot to members calling to complain about high electricity bills, taking advantage of those member interactions to recruit participants into the pilot.²

1. Smith, Mike, "Help My House Loan Pilot Program: Program Design and Results," Central Electric Power Cooperative and The Electric Cooperatives of South Carolina, 2013. www.cepci.org/assets/HelpMyHouseBrochure_June2013.pdf
2. Keegan, Partick, *Help My House Program Final Summary Report*, 2013. Prepared for Central Electric Power Cooperative (Columbia, South Carolina) and The Electric Cooperatives of South Carolina (Cayce, South Carolina), June 2013. http://www.cepci.org/assets/HelpMyHouseFinalSummaryReport_June2013.pdf

Facilitate Program Participation

In designing and implementing programs, State Energy Offices should make it easy for customers to participate, keeping the time and energy costs associated with applying for financing, implementing, and evaluating projects to a minimum. This may occur in several ways, including: easy access to clear eligibility standards and easy-to-understand information; quick turnaround times for application review and approval; the use of account representatives or other program staff to provide one-on-one technical and troubleshooting assistance to program participants; the establishment of pre-qualified networks of contractors and companies that participants may choose from; and/or the inclusion of quality control, quality assurance, feedback mechanisms, and savings measurement and verification measures.

Making Energy Financing Clear and Easy in Tennessee

For Tennessee, Pathway Lending's website¹ offers targeted marketing and information for prospective borrowers of commercial energy efficiency loans. Program participation is streamlined, with approval decisions made for qualifying loans within 24 hours of application submission, an option for loan recipients to finance program fees or other costs, the assignment of a dedicated Pathway Lending Associate to each recipient, and transparency in loan application and underwriting.²

1. <https://www.pathwaylending.org/loans/Efficiency-Loans>
2. Interview with Amy Bunton and Paul Hoffmann, Pathway Lending, December 2012.

Attracting Alabama Businesses to Energy Efficiency with Program Improvements¹

The Alabama State Energy Office, the Alabama Department of Economic and Community Affairs (ADECA), in partnership with third-party program administrator Abundant Power Solutions, LLC, has designed the Alabama Sustainable and Verifiable Energy Savings (AlabamaSAVES) Program with their commercial and industrial customer base in mind. The program enables businesses to secure below-market rate financing for energy improvements to existing facilities, ranging from a minimum loan size of \$50,000 up to \$4,000,000. It offers direct loans at 1% interest rate for qualified applicants in addition to subsidies for loans from third-party lenders in the form of a 10% loan loss reserve and interest rate buy-down of up to 500 basis points.

Through the use a robust feedback mechanism that solicits input from participants and partners, the program has undergone a number of changes to improve the delivery of financing and services. In early 2012, AlabamaSAVES underwent a redesign to introduce process improvements like streamlined application processes, simplified payback requirements, and reduced post-project report requirements. As part of the redesign, ADECA and Abundant Power also introduced a \$50,000 loan product to better attract businesses in need of projects that are smaller than the program initially intended to finance.

1. Interview with Kathy Hornsby, Alabama Department of Economic and Community Affairs, November 2012.

Mitigate Risk

Credit risk can be one of the most important factors in a lender's decision to offer financing to a customer, particularly outside of the public buildings market (because most state and local governments are recognized by the lending community to have minimal credit risk, financing tends to be more easily accessible for public energy efficiency and renewable energy projects). Typically, even in circumstances when lenders are willing to lend money directly to residential and private

commercial customers, the interest rate offered may be high and thus deter energy investments. Programs and green bank structures that place an emphasis on public-private partnerships are allowing states to combine resources, expertise, and capital to increase lender willingness to make energy efficiency loans. Over time, such programs are able to use their track record in delivering a high rate of repayment and other anonymous loan performance data to demonstrate the value of energy efficiency and renewable energy investments to the lending community at large.

Collaborate with Partners and Stakeholders

Most state financing programs require enabling legislation, and thus cannot be initiated overnight but rather may be a prolonged, multiyear effort requiring extensive stakeholder engagement. Even in cases where legislative action is not required, successful programs still engage key partners and involve them in program design, execution, and marketing, and take advantage of established relationships among stakeholders within the state. This exercise ensures that the program design will meet the needs of the

Public-Private Partnerships in Massachusetts Achieve Significant Leverage¹

Established in 2006 by the Energy Office in Massachusetts, the Department of Energy Resources (DOER), the Home Energy Assistance Team (HEAT) Loan program offers zero percent loans from participating lenders to support the installation of qualified energy efficiency improvements in their homes. Loans are available in amounts up to \$25,000 with terms up to seven years for energy efficiency projects, including attic, wall, and basement insulation; high efficiency heating systems; high efficiency domestic hot water systems; solar hot water systems; seven-day digital programmable thermostats; and ENERGY STAR® qualified replacement windows.

Through 2012, cumulative issuances of HEAT loans totaled approximately \$140 million, with the cost to the Commonwealth of the interest rate buy-down around \$7.8 million—about 5.5% of the loan volume (excluding administrative costs). The credit enhancement has resulted in a high leverage ratio and is enabling state banks and lenders to gain experience in residential energy efficiency lending while offering zero-interest loans to homeowners.

1. Interview with Elise Avers, Ian Finlayson, and Dan Sardo, Massachusetts Department of Energy Resources, November 2012.

customers and that service providers will participate in the program. The need for this stakeholder process is another important role well suited to the State Energy Offices. As nonregulatory, policy entities reporting to the governors and legislatures, they are ideally situated to convene stakeholders, and develop financing goals and policy concepts. In addition, the State Energy Offices' strategies in this area may include providing training and resources; developing channels to solicit and incorporate input, ideas, and feedback on programs and projects; and connecting customers with the relevant industry professionals that execute energy audits, projects, and evaluations.²⁴

These organizations are critical because they deliver expertise, marketing power, and customer relationships needed to drive program outcomes. All of the programs reviewed in this report operate in conjunction with state and nongovernmental partners, and include collaboration with stakeholders, such as those identified in Exhibit B. A hallmark of many effective state energy financing programs is an established and trusted relationship with local lenders.

Exhibit B. Sample of State Energy Program Financing Partners and Stakeholders

- Lenders / Banks / Credit Unions
- Utilities
- ESCOs
- Technology Vendors
- Industry Associations
- Environmental Agencies
- Economic Development Authorities
- Law Firms
- School Districts
- Universities
- Nonprofit Organizations
- Foundations
- State Associations
- Municipalities
- State Legislature
- Other State Agencies
- Public Utility Commissions
- U.S. Congress
- Local ESC Chapter
- Distributors
- Consultants
- Construction Contractors
- Unions
- U.S. Department of Energy
 - Industrial Assessment Centers (IACs)
 - Clean Energy Application Centers (CEACs)
 - Technical Assistance Providers, such as the Energy Programs Consortium (EPC)
- U.S. Department of Commerce
 - Manufacturing Extension Partnerships (MEPs)

Different program benefits and features will appeal to different types of stakeholders, so a robust approach can be beneficial in terms of ensuring there is something attractive for everyone. Stakeholders that participate in energy financing programs are realizing benefits beyond reduced utility costs. For some, a compelling motivation may be avoiding new generation, enabling switching to a lower cost fuel, or spurring economic development. These programs generate demand for skilled jobs and improve the skills, training, and experience of the labor force. Other program features that interest stakeholders can include site visits and tours of finance projects, public and media recognition, networking events, crosscutting nonenergy benefits, and access to state-of-the-art technologies.

Support Program Longevity

A program should have a clear understanding of its target market(s) and the needs and opportunities for energy efficiency financing within it, and structure resources accordingly to ensure that it delivers sufficient capital, staff, and a network of businesses and contractors to meet these needs. It must also be sufficiently funded to ensure that it introduces the appropriate levels and costs of capital into its target market(s), and to effectively meet program management and administration costs for the life of program.

Oregon's Long-Lasting State Energy Loan Program¹

One of the longest running state energy financing programs, the State Energy Loan Program of the Oregon Department of Energy (ODOE), offers a relatively uncomplicated financial product: direct loans revolved through the program fund. SELP has used bond financing to deliver nearly \$600 million of financing for energy efficiency and renewable energy projects since its inception. The program does not place a cap on funding; so long as a project meets the program criteria, it can be financed without concern of running up against a funding ceiling. To meet demand more quickly, ODOE established a line of credit that can be used to launch approved projects in advance of bond issuances. The program has remained in place due to the passage of a constitutional amendment that launched the program; and continuous education of publicly elected decision makers (throughout changes in leadership) and the public regarding the value of clean energy investments financed by taxpayer dollars.

1. Interview with Daniel Weldon and Anthony Buckley, Oregon Department of Energy, December 2012.

Creating a Secondary Market for Residential Energy Efficiency in Pennsylvania, Kentucky, and Beyond¹

In partnership with the Energy Programs Consortium, Citigroup Global Markets, and Renewable Funding, and with support from NASEO, the Pennsylvania State Treasury helped create the Warehouse for Energy Efficiency Loans (WHEEL), the first program that aims to bring residential clean energy loans to the secondary market. WHEEL purchases unsecured residential loans originated in participating programs (available across multiple states); aggregates and securitizes them; and issues rated asset-backed notes. Proceeds are used to recapitalize WHEEL, allowing the facility to continue purchasing eligible loans from state and local programs for future rounds of bond issuance. Since its creation, the State of Kentucky has committed funds to WHEEL, with growing interest from other key states operating residential energy efficiency programs.

As of August 2013, the Pennsylvania Treasury Department had formalized its commitment to participate in WHEEL, and the Commonwealth of Kentucky announced that the Tennessee Valley Authority (TVA) would provide \$3 million in funding to support loans for sale into the WHEEL program. Additionally, WHEEL has been listed as one of three pilots under consideration in the State of California. As progress continues to be made in completing the legal documentation needed to bring WHEEL live, the program is expected to begin purchasing its first loans in 2014 at the target rate of below 10%.

- 1) Bellis, Elizabeth and S. Sieting Alim, "EPC Update: Warehouse for Energy Efficiency Loans (WHEEL) Project," Energy Programs Consortium, August 2013.

Consistency and sustainability are important program design considerations that support market transformation over time and should be considered in the way states structure and support financing programs. Some state energy financing programs have been in place for over 30 years and have served in their target market(s) as reliable and popular sources of financing. A key influencing factor that results in this type of sustained impact is the ability to develop a sustainable business model that leverages private capital and investment, avoids draining public resources, and/or generates revenue to pay back program administration costs.

Planning for long-term program ownership may also come in the form of an "exit strategy" or leveraging approach that transitions the operation of the program from the public to the private sector or enables the program to achieve scale beyond that made possible by direct lending. Creating and sustaining support in both the public and private sectors from the beginning of the program will increase the likelihood of success. An emerging trend is to develop programs with lending and underwriting practices that suit the needs not only of primary market actors, but also investors in the secondary market, enabling state programs to use note sales to increase loan volume and potentially offer lower interest rates.

Major Benefits and Challenges by Program Type

Exhibit C, below, outlines some of the major benefits and potential challenges associated with each program type and approach inspected in this report.

Exhibit C: Major Benefits and Challenges of Program Types

	Potential Benefits	Potential Challenges
Bond Issuance	Bond authority in many states is high, with no sunset date A form of “patient” capital, enabling low interest rates and long terms offered to the consumer	Growing the project pipeline to justify bond issuance takes time, administration Adds to public debt
Secondary Market Sales	Scales to meet high demand Access to virtually unlimited source of private capital Opportunity to tap lowest-cost, scalable capital	Need to cater programs to suit secondary market investor and rating agency comfort and risk tolerance levels (in terms of exposure to credit risk, and lending and underwriting practices)
Credit Enhancement	Leverages private sector capital Can attract primary and secondary market investors Often reduces interest rate borne by customer	Holds public entity responsible for loan defaults, poor performance States must follow DOE guidance to expend federal grants through credit enhancements
Energy Infrastructure Bank	Reduces cost of capital (compared to conventional financing) by combining public and private capital in one investment fund	Need to more clearly define energy infrastructure banks, create distinction from other types of public-private funds May require legislative and/or executive action to be established
ESPC	Guaranteed energy and cost savings Minimal or no financial impact on property owner coffers Master contracts and pre-qualified pools of ESCOs and contractors streamline the procurement process Property owner autonomy over selection of project team and major equipment Frees up public budget funds	Extended financing term requires “patient capital” and may be unattractive for private commercial property owners Management of procurement, contract, and ESCO may be complex for program participants without technical understanding or staff bandwidth Equipment and project must meet industry engineering standards
On-Bill	Under typical conditions, cash-flow positive to the customer Normally tied to the meter, so remaining project costs are assumed by new tenants in case of changeover Many programs use utility payment history as a proxy for creditworthiness, enabling low-income participants to access the program	Poses upfront costs to utilities to modify billing systems Poses potential (albeit small) risk of nonpayment of financing charge Some utility reluctance to act as a financial institution, resulting in emergence of on-bill repayment and recovery as alternatives to on-bill financing
PACE	Improvements and lien stay with the property upon sale and transfer of title Requires little to zero local or state government investment Repayment term is long, correlated with benefits and useful life of equipment used rather than property ownership Typically provides 100% of project capital, greatly lowering upfront costs to property owners	Residential PACE road-blocked by FHFA and GSAs At times, mortgage lenders reluctant to approve senior lien PACE special assessment districts are geared towards property owners (not tenants), failing to overcome the split incentive problem Requires enabling legislation at state government level and buy-in at local government level Some PACE loans originate from municipal bonds or other capital sources, which may be an unattractive option for debt-averse entities
Revolving Loan Funds	Relatively simple to administer and track Provides ongoing funding stream for energy efficiency and renewable energy projects Long track record of State Energy Office administration Typically does not require loans to be secured, though credit review is often necessary	Project approval is usually based on pre-approved measures rather than measurable savings, so application criteria need to be updated as technology evolves Very little data on energy savings is available

Promising Approaches

Much of the success of energy efficiency and renewable energy financing programs is reliant on the particular market, consumer base, stakeholder community, and workforce in which they operate. Although there is no “one-size-fits-all” program type, NASEO’s analysis has unearthed several themes and trends that are gaining traction across the country and are being increasingly recognized by State Energy Offices as ripe for replication.

Notably, the most promising approaches discussed and elevated by NASEO’s members and partners address six key imperatives:

1. Designing a payback structure that creates an attractive return for private sector investors;
2. Achieving a cyclical and/or growing funding stream that allows the program to be a consistent option in the target market as long as opportunity or demand is evident;
3. Designing program structures that cover administrative costs;
4. Tapping into funding sources that do not depend on government subsidies;
5. Ensuring access of typically underserved segments of the population to the program; and
6. Attaining flexibility of program design to allow for supporting strategies and approaches unique to particular states and communities.

In this light, our analysis has identified three breakthrough approaches that are beginning to redefine the path of state energy financing and may offer potentially game-changing alternatives to ramp up energy efficiency and renewable energy investments and project implementation to a scale that has not yet been achieved through conventional financing and funding structures.

Energy Infrastructure Banks

While state energy infrastructure banks and similar large-scale programs can take different forms based on each state’s unique circumstances, they essentially combine scarce public resources with private sector funds and then leverage those funds to invest in attractive renewable energy and energy efficiency projects. A timely benefit of the low-cost financing that these banks will make available is that it will reduce renewable energy and energy efficiency projects’ dependence on diminishing federal grants, tax credits, and subsidies, and can lower the cost of these projects enough to make them cost competitive. Importantly, advancing these technologies will aid in diversifying the country’s energy resources and strengthening the resilience of its infrastructure.

By leveraging State-directed public benefit and ratepayer funds, existing state energy loan funds, economic development funds, bonding authority, tax credit programs, private capital, and philanthropic funds, a carefully crafted energy infrastructure bank would enable a state to create and implement large-scale sector-specific energy efficiency, renewable energy, energy storage, and energy infrastructure financing programs (e.g., for commercial buildings, multifamily housing, and energy infrastructure). In an economic environment where state and local governments are increasingly utilizing public-private partnerships to catalyze energy-related economic development and infrastructure modernization—including public facility retrofits—the opportunity is ripe for state and local governments to take the lead on developing innovative energy banks.

A promising aspect of state-run energy banks is the potential for State Energy Offices and their partners to combine various financing and funding mechanisms, leverage public funds with private capital, and sculpt well-designed and sophisticated projects and programs achieving significant impact and scale in their

financing. Key to their success will be linking this access to capital with state energy policies, and the supported programs offered by most State Energy Offices. New York's recent bond sale as part of the Green Jobs-Green New York program offers a compelling example of how states may be able to overlay various financing and programmatic strategies to this end: its combined and innovative use of a revolving loan fund, QECB allocation, and bond issuance, along with NYSERDA's ability to forge inter-agency partnerships and engage key investment institutions and rating agencies, allowed the state to raise more than \$24 million in proceeds, which will replenish the original \$42.5-million revolving loan fund that enabled the direct and on-bill recovery loans in the first place.²⁵

In a similar vein, an increasing number of states (e.g., Connecticut, California, and Hawaii, among others) are now leveraging public funds with more sophisticated banking and finance mechanisms on a scale not previously seen in the energy efficiency and renewable energy sector. In so doing, these states are in the process of unlocking billions in new capital to open markets and accelerating innovation and enabling structures like WHEEL, which engage private sector capital, to bring new capital and volume to the energy efficiency and renewable energy financing field.

A Twist on the ESCO Model for Commercial PACE

A key barrier to the \$12 billion potential market for commercial and multifamily building energy efficiency retrofits is a lack of confidence that promised energy savings and the expected return on investment will be realized; this dynamic often limits the availability of financing options.²⁶ However, in addition to offering secure, long-term repayment for energy projects for commercial buildings, a significant advantage offered by commercial PACE is the opportunity to overlay and incorporate performance risk mitigation strategies to ensure project performance and create a credible guarantee of savings to service the debt. One such strategy is to introduce a performance guarantee (along the lines of energy savings guarantees assured in public sector ESPC programs) to PACE-financed projects. Particularly for states and jurisdictions where triple-net leases are prevalent in the commercial buildings stock (under which, in contrast to gross leases, the tenant is responsible for paying all taxes, insurance, maintenance, and utility expenses in addition to their monthly rental payment), some form of a performance guarantee can increase confidence that the additional tax passed through to the tenant will be offset by actual energy savings.

Facilitating partnerships with ESCOs on PACE would increase the likelihood of performance guarantees becoming a standard or expected component of PACE-financed projects. Over time, State Energy Offices or other state-sanctioned special purpose entities with expertise in performance contracting could perform a number of useful roles, including (as Connecticut's CEFIA did) structuring a uniform statewide program design that creates standard contracts, pre-qualified providers, and clear retrofit performance expectations that local governments and private commercial building owners can rely upon over the course of the PACE retrofit process.

On-Bill Approaches

On-bill financing and repayment programs are gaining traction across the country, with more than 20 states having some sort of support policy or structure in place. As of July 2013, on-bill financing had been mandated in five states; seven states had enacted or were considering enacting policies that support on-bill financing; and individual utilities offered on-bill financing in another nine states.²⁷

A key facet of on-bill programs is their ability to transform the market for energy financing by including program participants that may normally lack access to financing. In particular, on-bill programs' use of utility payment history as a proxy for creditworthiness extends credit to customers that may typically be viewed as unattractive loan recipients, for reasons such as lacking equity in the property to justify a secured

mortgage loan or lacking the surplus income to dedicate to the loan repayment. The broad base of customer eligibility, coupled with the secure repayment mechanism via the utility bill and an emphasis on maintaining cash-flow positive repayment terms, makes for a promising approach that could yield significant results in both the residential and commercial sectors.

Despite these advantages, the design process for on-bill programs requires extensive engagement with key stakeholders. State Energy Offices are well positioned in their states to serve as arbiters and supporters of on-bill financing, repayment, and recovery programs. As liaisons and conveners of various state, federal, local, and private entities, they conduct their work by balancing a variety of public and private interests in support of gubernatorial and legislative energy and economic development goals. Energy Offices actively and effectively inform executive and legislative policy development, and engage with the public utility commission. As flexible yet influential entities with a keen understanding of the level of demand for energy efficiency within their states and a deep appreciation for various stakeholder interests, the Energy Offices face a growing opportunity in many states to steer the future of on-bill programs to ensure customer inclusivity, project performance, and program convenience.

Conclusions and Next Steps

At least 44 states and territories operate one or more energy financing programs, with successful efforts expanding and being replicated across the country at a rapid pace. The individual and collective experience of 56 State and Territory Energy Offices can provide critical information and lessons learned as newcomers enter the energy financing market and begin to piece together the right “puzzle” for their jurisdictions and target markets.

Currently, there are 79 state energy loan funds available in 44 states and territories.²⁸ The total amount of funding dedicated to state energy loan funds identified in the NASEO State Energy Loan Fund (SELF) database is more than \$2 billion, not including capital being used to seed large-scale energy banks in states like New York, Connecticut, and Hawaii. However, even with over 30 years of experience, billions of dollars invested, and aggressive education, workforce development, and data collection efforts, the financing that is accessible at the state level for energy projects, at attractive interest rates, does not match the enormous need. Our nation has an opportunity to drive rapid market transformation and realize the economic potential, employment opportunities, and environmental benefits of the \$520 billion market for energy efficiency and renewable energy projects and technologies.

The programs reviewed in this report were designed to suit the unique characteristics and needs of their respective state or local jurisdictions. Their structures range from formal organizations to established customs and relationships. Many are customer-oriented and designed with flexibility in mind. As a result, each program is different; there is no “one size that fits all.”

NASEO's State Energy Financing Committee and the expert Advisory Group completed an important first step in propelling energy efficiency and renewable energy investments by identifying the status of state energy financing programs, along with barriers and best practices. Going forward, the Committee will work with the states interested in developing or improving their financing programs to identify their unique barriers, status of current program development efforts, and using this research, offer a suite of support options to help design a fitting financing program. NASEO offers its members the unique benefit of being able to establish information exchanges across states on shared energy challenges, which elevates successful approaches and catalyzes their expansion across state borders.

Appendix A: NASEO Financing Advisory Group

This committee was established by NASEO for the purposes of compiling data, identifying best practices, and proctoring the content of this report.

- Jeff Pitkin, Treasurer, NYSERDA
- Al Christopher, Director, Virginia Department of Mines, Minerals, and Energy
- Peter Adamczyk, Managing Consultant, Vermont Energy Investment Corporation
- Elizabeth Bellis, Counsel, Energy Programs Consortium
- Cisco DeVries, President and CEO, Renewable Funding
- Jeff Genzer, General Counsel, NASEO, Vice-President, Duncan, Weinberg, Genzer & Pembroke, P.C.
- Pat McGuckin, Financing Programs Manager, Cadmus
- Dan Reicher, Executive Director, Steyer-Taylor Center for Energy Policy and Finance
- Dan Scripps, Vice President of Capital Innovation, Advanced Energy Economy
- Peter Smith, Managing Director of Climate Change, Energy and the Environment, Pataki-Cahill Group
- Roya Stanley, President, Energy Initiatives, LLC
- Tom Weithman, Managing Director, Center for Innovative Technology
- Stockton Williams, Principal, HR&A Advisors
- Mark Zimring, Senior Research Associate, Lawrence Berkeley National Laboratory

Additionally, the author would like to thank Roya Stanley, President, Energy Initiatives, LLC, for her significant contributions in conceptualizing, researching, and developing this report.

Appendix B: Approach to Evaluation of State Financing Programs

Twenty-one financing programs across 20 states were reviewed in detail with regard to programmatic approach, market penetration, stakeholder engagement, and sustainability. A full listing of the program elements that were evaluated is shown in the table below.

Program Evaluation Categories	
Evaluation Category	Information Collected
General Program Information	<ul style="list-style-type: none"> ✓ Name of program ✓ Description of program ✓ Implementing agency ✓ Administrator ✓ Program Type ✓ Budget ✓ Target Market
Category 1. Program Approach	<ul style="list-style-type: none"> ✓ Commitment from agency ✓ Transition support ✓ Sizing of available resources ✓ Collaboration with stakeholders and market interests
Category 2. Overcoming Barriers in Targeted Market Sector(s)	<ul style="list-style-type: none"> ✓ Market sector barriers identified and addressed ✓ Access to capital provided ✓ Access to clear information ✓ Ease of program participation ✓ Risk mitigation strategies
Category 3. Stakeholder Engagement	<ul style="list-style-type: none"> ✓ Utilities ✓ Banks/Financiers ✓ Technical community (engineers, architects, contractors, or other specialists) ✓ Other state and/or local agencies
Category 4. Quality	<ul style="list-style-type: none"> ✓ Dynamic feedback on program implementation and process ✓ Quality control and assurance structure ✓ Measurement and verification of project results
Category 5. Market Penetration	<ul style="list-style-type: none"> ✓ Marketing/sales program and reporting structure ✓ Engage stakeholders to assist with marketing
Category 6. Securing Governmental Support	<ul style="list-style-type: none"> ✓ Support of program from “champions”
Category 7. Program Sustainability	<ul style="list-style-type: none"> ✓ Ability to maintain operation of program, either in the public sector or by transitioning program operations and demand to private sector
Category 8. Potential for Replication	<ul style="list-style-type: none"> ✓ Program components and characteristics that other state or local entities may want to consider in designing, developing, and implementing programs

NASEO reviewed secondary research on financing programs for energy efficiency and renewable energy technology in addition to publicly available information offered by state and local governments, private sector companies, utilities, and other organizations. This review, along with the experience of senior NASEO staff and consultants, in consultation with an expert Advisory Group (see Appendix A), assisted in the development of a set of criteria used to review programs. As necessary, the NASEO team conducted interviews with selected program staff and experts to verify the information collected and gather additional details on the operations of selected financing programs. Finally, NASEO conducted a qualitative analysis to identify potential barriers, opportunities, and success drivers that have an impact on the delivery, quality, and results of a financing program.

The programs selected for review represent a range of financing types, address all nontransportation end-use sectors, and are distributed geographically across the nation. Some of the selected programs have operated for 20 years or more; others have only a few years of experience or were recently launched. Programs were selected that include components that meet a significant number of the criteria that were identified as being essential to highly successful programs.

NASEO developed the following eight criteria for evaluating states' financing programs and mechanisms:

Category 1. Program Approach

A sustained state energy financing program that achieves significant market transformation requires program design and execution that not only address key market failures and barriers, but also create a framework for long-term sustainability and effectiveness. A number of strategies and characteristics define a successful program:

- Agency commitment
- Ability of program to respond to feedback and incorporate improvements
- Transition support
- Sizing of resources to meet need in target sector(s)
- Collaboration with stakeholders

Category 2. Overcoming Barriers in Targeted Market Sector(s)

Successful programs are designed and implemented to address and overcome market failures inhibiting investment in energy efficiency. Access to capital at affordable rates is one of the critical barriers facing the energy technologies marketplace; even prior to the global financial downturn, many potential energy efficiency borrowers faced (and continue to face) difficulty with accessing capital for energy efficiency and renewable energy projects. In some cases, projects or borrowers do not meet the stringent criteria of the lenders that are willing to offer loans. Where capital is available, it is at a high cost that inhibits a project from achieving a positive cash flow or attractive return on investment.

Multiple market failures beyond the challenge of access to reasonable cost financing interfere with the adoption of energy efficiency measures. In addition to difficulty accessing capital and/or attractive financing, programs may be designed to overcome a litany of other barriers, including:

- Lack of staff time or facilities and business managers to manage energy efficiency and renewable energy projects
- Lack of business, property owner, and/or financier awareness or comfort with energy efficiency projects and the risk of project failure
- Shortage of knowledgeable contractors
- Concern with potential interference of energy efficient construction and installation with facility operations and productivity

- Lack of operations staff time to maintain and effectively operate equipment to assure that savings persist
- Competition with other investment priorities that may deliver either or both financial and nonfinancial benefits
- Inability of markets and governments to recognize externalities, such as the impacts of air pollution, carbon emissions, and water contamination, which undervalues energy efficiency and renewable energy technologies in relation to conventional technologies.\

Effective programs therefore see financing not as a “silver bullet” but as a necessary ingredient in a robust, multidimensional program designed to address both financial and nonfinancial barriers.

Category 3. Stakeholder Engagement

Involving key customers and stakeholders early will not only result in a workable program design, but also will assist with marketing the program. Potential stakeholders include:

- Utilities, which may offer programs and incentives to attract customer participation, choose to provide seed capital for a loan fund or other financing tool, or need to agree to modify their billing and operating procedures to accommodate a specific type of financing.
- Banks, investors, community development financial institutions, credit unions, or other members of the financial community. Creating a financing program for energy efficiency and renewable energy creates a business opportunity for these stakeholders. Engaging the financial community in the design of the program will ensure that the structure of the program encourages their participation.
- Technical practitioners and providers, such as engineers, architects, contractors, equipment suppliers, and ESCOs. Active participation by well-trained and reputable providers is one key to offering service in a timely manner that provides the energy results projected. Engaging the providers early in the construct of the program design can help to establish a program that providers view as a good business proposition for them.
- Other state or local agencies besides the State Energy Office, which may administer programs that can work in collaboration with an energy efficiency or renewable energy financing program.

Category 4. Quality

Energy efficiency and renewable energy financing programs must deliver results—often in the form of savings or generation as projected—in order to maintain and expand confidence and participation by the target market. A robust quality process is key to ensuring positive outcomes and sends a signal to prospective program participants that they will receive adequate and timely service and a satisfactory, consistent, and expected energy savings outcome for their projects.

Establishing a project tracking structure allows program managers to receive feedback and identify which aspects of the program are working and which might need assistance. In addition to a formal tracking structure, it is important to establish a culture of seeking and acting on feedback from participants in shaping a program.

Category 5. Market Penetration Results

A marketing and sales plan is essential to achieving robust participation in an energy efficiency and renewable energy program, by making the business case and building demand for projects. An effective strategy is to mobilize marketing channels and networks that reach the target market. For instance, many successful programs employ account associates to recruit potential participants, tap into local networks of contractors or utilities to originate projects and market programs, and provide ongoing marketing

materials and training to key stakeholders. This strategy takes advantage of on-the-ground interaction with facility owners, property managers, and homeowners. Often programs will incorporate contractor training or pre-qualification processes in order to ensure that contractors are relaying accurate and helpful information to potential borrowers.

Category 6. Securing Governmental Support

Achieving significant results requires many years of successful operation, typically spanning multiple administrations and staff changes. Successful programs have maintained support by the legislature and governor through transitions. Maintaining a trained staff to deliver the program is also crucial to building program momentum. Experienced program managers start to think about staff transitions early in the program.

Category 7. Program Sustainability

Planning for the long-term ownership and operation of a program allows it to continue operating beyond a fixed program life, and increases stakeholder confidence in the program's potential and future impact. Such planning may come in the form of identifying and justifying the continued need for public subsidy and government intervention. In this case, agency commitment must be sufficient to support the time and energy needed from staff, champions, and stakeholders to plan and implement a successful program and operate it for the long term.

Planning for long-term program ownership may come in the form of developing an "exit strategy" that transitions the operation of the program from the public to the private sector. Creating and sustaining support in both the public and private sectors from the beginning of the program will increase the likelihood of success.

Category 8. Potential for Replication

Programs that are designed with reliability and scalability in mind promote market transformation by helping others take on similar initiatives with progressively smaller transaction costs. Numerous financing mechanisms, particularly in the public sector and performance contracting industry, have demonstrated success at sufficient scale to enable the creation and application of model legislation, policies, practices, and mechanisms that other states and local governments can learn from and use.

Appendix C: Evaluated Programs

The following profiles offer a summary of the state energy financing programs that have been evaluated for this study.

Alabama Sustainable and Verifiable Energy Savings Program²⁹

Implementing Agencies:	Alabama Department of Economic and Community Affairs (ADECA) Energy Division in partnership with third-party administrator Abundant Power Solutions, LLC
Program Type:	Revolving Loan Fund and Credit Enhancement
Funding Source:	\$25 million from State Energy Program (SEP)
Target Market(s):	Commercial, Industrial
Overview:	<p>The Alabama Sustainable and Verifiable Energy Savings (AlabamaSAVES) Program offers the only energy revolving loan fund for existing industries and businesses within the state. The program was created with a \$25 million State Energy Program (SEP) grant from the U.S. Department of Energy. The program is administered by a third party, Abundant Power Solutions, LLC, a national financial services company focused on energy efficiency products and solutions.</p> <p>AlabamaSAVES enables businesses to secure below-market rate financing for energy improvements to existing facilities, ranging from a minimum loan size of \$50,000 up to \$4 million. The loan term covers the blended useful life^{vii} of the improvements up to a maximum of 10 years, although exceptions may be made to the 10-year limit when proposed measures exceed ASHRAE 90.1 2010 standards. Allowable expenditures for loan funds include energy assessment costs, engineering fees, commissioning costs (both retro-commissioning as an energy savings measure and commissioning of newly implemented measures), project management fees, equipment costs and equipment installation labor costs for renewable energy systems, and energy efficiency measures installed on property owned or leased by a borrower. AlabamaSAVES offers direct loans at 1% interest rate for qualified applicants in addition to subsidies for loans from third-party lenders in the form of a 10% loan loss reserve and interest rate buy-down of up to 500 basis points.</p>
Notable Program Approaches and Accomplishments:	<ul style="list-style-type: none"> • Credit enhancements for lenders (including loan loss reserve and interest rate buy-down) have expanded the impact of the original \$25 million grant to leverage approximately \$65 million in projects throughout the state. • As part of a public-private partnership, both ADECA and Abundant Power have committed significant financial and/or personnel resources to the program, including funding as well as staff time to discuss and review projects. • Program involves multiple financing partners (local, regional, and national banks). Prospective borrowers are encouraged to introduce their preferred lender to the program, which often results in streamlined credit review and approval. • Program marketing through regular communication and partnerships with stakeholders, including economic development groups, industry groups, and utilities. • Partners have responded to program feedback, and have adapted services to improve delivery. For instance: <ul style="list-style-type: none"> • Originally, Abundant Power had planned to structure the credit enhancements rather rigidly, but lenders requested more flexibility, and it was granted. • The program underwent a redesign in early 2012 to introduce process improvements like simplified pay-back requirements, reduced post-project reporting requirements, and streamlined application processes. • The loan interest rate can be adjusted over time as the market changes or to accommodate public subsidy phase-out, to keep the program sustainable. • The application process was streamlined by simplifying the technical requirements of the program with the key metric for project selection focusing on a simple 10-year payback; and launching a new loan product at the unconventional \$50,000 level, which is helping to attract more projects.

^{vii} Assumed amortization coupled with estimated addition of value to the existing asset.

Colorado Private Sector Energy Savings Performance Contracting Pilot Program³⁰

<i>Implementing Agency:</i>	Colorado Energy Office
<i>Program Type:</i>	Energy Savings Performance Contracting
<i>Funding Source:</i>	State Energy Program (SEP) Competitive Grant
<i>Target Market(s):</i>	Commercial (private)
<i>Overview:</i>	<p>Through its Private Sector Energy Savings Performance Contracting (ESPC) Program, the Colorado Energy Office (CEO) is working to transfer lessons learned from Colorado’s extensive experience in public sector ESPC to private sector entities. The CEO received a competitive grant award from the U.S. Department of Energy’s (DOE) State Energy Program (SEP) in 2011 to introduce select private sector partners to the EPC process as a means to establish and achieve ambitious energy goals and advance energy projects in their facilities.</p> <p>Interested eligible organizations (which may include private companies and corporations, nonprofit organizations, privately owned hospitals, or other privately owned facilities) are hand-selected by CEO based on a number of criteria, including project merit and finances, company willingness to implement energy improvements, and size of past utility bills. Selected partners enter into a contractual relationship with the CEO and receive free project guidance and technical assistance to facilitate project completion. In addition, partners are eligible for a subsidy of 75% (capped at \$25,000, less any available utility rebate) for a technical energy assessment and will have their successful projects highlighted by the CEO.</p> <p>As of December 2012, CEO has accepted 10 businesses to the program. These partners receive free technical assistance and education from Nexant, under contract to CEO.</p>
<i>Notable Program Approaches and Accomplishments:</i>	<ul style="list-style-type: none"> • In a traditional ESPC, energy audits can cost up to \$30,000; private organizations are often unwilling to take on such a high cost without knowing that a project will move forward. Program offers an audit subsidy to address this market barrier. • Proactive engagement with Xcel, an investor-owned utility with approximately 60% of the load in the state and robust demand-side management programs. During pilot design, Xcel account executives helped identify potential leads and review solicitations and signed a letter of support allowing CEO to use their energy efficiency investments in their service territory as a match on the grant. • CEO conducted a focused solicitation process in an attempt to get broad geographic and industry representation, with the intent of demonstrating the value of ESPC in a wide variety of applications. Program now includes a broad range of organizations, including in the manufacturing, hospitality, and multifamily housing sectors.

Connecticut Clean Energy Finance and Investment Authority ²¹	
<i>Implementing Agency:</i>	Connecticut Clean Energy Finance and Investment Authority (CEFIA)
<i>Program Type:</i>	Green Bank
<i>Funding Source:</i>	Various (electric ratepayer funds, Regional Greenhouse Gas Initiative (RGGI) proceeds, federal funds, private capital)
<i>Target Market(s):</i>	All sectors
<i>Overview:</i>	<p>The Clean Energy Finance and Investment Authority (CEFIA) was created in 2011 by the Connecticut Legislature as part of Public Act 11-80, An Act Concerning the Establishment of the Department of Energy and Environmental Protection and Planning for Connecticut's Energy Future. CEFIA's predecessor was the Connecticut Clean Energy Fund (CCEF), which was created in 2000 by the Connecticut Legislature and which funded more than \$150 million in renewable energy projects, emerging technology investments, and awareness programs statewide.</p> <p>CEFIA invests its resources in an array of enterprises, initiatives, and projects aimed to attract and deploy capital in support of the clean energy goals of Connecticut; develops and implements strategies that lower the cost of clean energy to make it more accessible and affordable to consumer; and reduces reliance on grants, rebates, and other subsidies to move toward innovative low-cost financing of clean energy deployment.</p> <p>CEFIA's programs are funded from a variety of sources, including a surcharge on residential and commercial electric bills, Regional Greenhouse Gas Initiative (RGGI) auction allowance proceeds, federal funds and grants, and private capital in the form of contracts executed with investors and other sources. The fund is overseen by the CEFIA Board of Directors, which includes the Commissioner of the Connecticut Department of Energy and Environmental Protection (DEEP), the State Energy Office. The Board approves CEFIA's Comprehensive Plan, policies, programs, and funding.</p>
<i>Notable Program Approaches and Accomplishments:</i>	<ul style="list-style-type: none"> • With \$90 million expected to be deployed in grants or loans by 2014, CEFIA is introducing capital into the clean energy marketplace through strategic public-private partnerships engaging state agencies, utilities, financial institutions, and private investors. • CEFIA Board of Directors includes wide range of stakeholders, including: Department of Economic and Community Development (DEDC); Department of Energy and Environmental Protection (DEEP), University of Connecticut, Coral Drive Partners (financial consulting firm), NJG Associations (consulting firm promoting use of compressed natural gas), Coalition for Green Capital (nonprofit financial advisory firm), State Treasury, AFL-CIO (labor unions), Shipman & Goodwin LLP (environmental law), and Operation Fuel (a nonprofit partnering with communities to ensure that people in need have access to year-round energy assistance).

Florida Property Assessed Clean Energy (PACE) Funding Agency (FPFA) ³²	
Implementing Agency:	Florida Property Assessed Clean Energy Funding Agency (FPFA), in partnership with third-party administrator SAIC Energy, Environment & Infrastructure
Program Type:	Property Assessed Clean Energy (PACE)
Funding Source:	FPFA Bond Authority (up to \$2 billion)
Target Market(s):	Commercial Buildings
Overview:	<p>In June 2011, two Florida jurisdictions, Flagler County and the City of Kissimmee, chartered an independent government agency, the Florida Property Assessed Clean Energy Funding Agency (FPFA), through an inter-local agreement. FPFA's mission is to provide simplified, no-cost access to the standardized implementation, planning, development, funding, financing, marketing, and management of a statewide Property Assessed Clean Energy (PACE) financing platform, and to make such a platform available to all counties in the state. Local governments subscribing to the program do so at no cost but must pass a local resolution and execute an agreement with the Agency in order to enable PACE financing in their jurisdiction. The Agency's charter fully insulates each subscribing government from any legal or financial liability as a result of the actions of the Agency or any other subscribing government. In 2012, Florida courts validated FPFA's subscription-based structure and its authority to issue up to \$2 billion in taxable revenue bonds for funding of financing agreements as permitted by law. Bonds can be issued on an as-needed basis for eligible efficiency, renewable energy, and hurricane resistance improvements. In February 2013, FPFA secured \$500 million in financing through a private third-party investor. Financial underwriting is not based on property owner creditworthiness, but rather currency of taxes and mortgage payments, and no involuntary liens encumbering the property. The Agency has elected to initially focus eligibility on commercial, industrial, and multifamily residential greater than four families. Nonconforming single family residential property owners will be eligible within 12 months. FPFA has the capacity to enroll any unit of local government in the state that elects to subscribe to the program. Third-Party Administrator, SAIC (Science Applications International Corporation) was selected to provide administrative services through its subsidiary SAIC Energy, Environment, & Infrastructure LLC. Administrative expenses of the program are recovered through an origination fee equal to 2% of total assessment and a 2% project assessment sharing with the contractors and voluntary underwriting from private industry equipment and material manufacturers</p>
Notable Program Approaches and Accomplishments:	<ul style="list-style-type: none"> • No state or local funds are used to fund the program; rather, program investors provide short- and long-term funding facilities for eligible projects at fixed interest rates and for repayment terms of up to 20 years or the useful life of the installed measures, and subsequent operating revenues flow from the annual nonad-valorem tax assessments. FPFA, together with SAIC, has designed a fee-based program that covers staff and administrative costs. • FPFA Board of Directors and staff hold regular meetings to make program development and implementation decisions. Meetings are open to the public and operate under Florida's Sunshine laws. • Florida's long history of severe hurricanes has focused attention on mitigation measures. Enabling legislation allows the use of PACE financing for wind mitigation measures and holds the potential for reductions in annual property insurance premiums. Further, energy efficiency and renewable generation systems are considered essential components in comprehensive disaster preparedness and climate change adaptation, allowing sheltering-in-place and continuity of essential business and public services during and after events. • These types of bonds can be issued by a special assessment district incorporated under the laws of Florida to benefit private property owners located within that district. Florida is designed using both short- and long-financing facilities. The short-term facility allows for project financing on demand until the outstanding principal reaches a prescribed level, at which time the Agency issues a bond that is purchased by long-term investors and the cycle repeats itself. • The Florida Circuit Court has validated that PACE liens are on par with property taxes and both hold a senior lien position to any other lien, and the statutory tax delinquency process allows for a generous two-year remedy period through the sale of tax certificates. The percentage of properties that have failed to remedy within that period, through extremely small, are largely ineligible for PACE and thus investors have found Florida PACE assessments to be extremely low risk.

Green Bank of Kentucky ³³	
<i>Implementing Agency:</i>	Kentucky Finance and Administration Cabinet
<i>Program Type:</i>	Green Bank
<i>Funding Source:</i>	American Recovery and Reinvestment Act State Energy Program (\$14 million)
<i>Target Market(s):</i>	Public Buildings
<i>Overview:</i>	<p>Officially launched in 2009 by Governor Steve Beshear and capitalized with more than \$14 million in American Recovery and Reinvestment Act (ARRA) State Energy Program (SEP) funding, the Green Bank of Kentucky promotes energy efficiency in state-owned buildings. Loans offered through the bank pay the full upfront costs of the energy savings projects and are repaid at a low interest rate, currently 0.95% annual interest over a maximum term of 14 years. Loan terms are structured so that agencies are able to repay the loan with projected savings, and these repayments replenish the loan fund to allow it to continue offering loans for other state energy efficiency projects. Low loan rates have helped to expand the scope and size of the projects.</p> <p>The Green Bank distinguishes itself from other existing public facilities energy efficiency loan funds because it offers a variety of loans and technical packages to meet the particular needs of participating state agencies:</p> <ul style="list-style-type: none"> - The eSELF Revolving Loan allows state agencies to self-perform energy efficiency projects costing between \$50,000 and \$225,000. The goal for the eSELF program is a 20% reduction in energy consumption, targeting state buildings with high energy costs. - The Hybrid Revolving Loan allows funding for energy projects in state facilities that cost between \$50,000 and \$600,000. An energy audit or engineering analysis is required along with a completed design and development package. State agencies are responsible for procuring labor and materials. - The Energy Savings Performance Contracting (ESPC) Revolving Loan funds energy efficiency projects typically costing more than \$600,000. These projects use investment-grade energy audits to provide a detailed cost-benefit analysis of energy efficiency investments. These projects also use a life-cycle energy cost analysis and require state agency collaboration with an energy service company (ESCO). <p>The Green Bank is overseen by an Executive Advisory Committee (the Loan Committee), which reviews loan applications, sets the interest rate (normally at about 1% below available commercial rates), approves or denies applications for loans, and approves the issuance of loan proceeds. The membership of the Loan Committee is established by an administrative order from the Finance and Administration Cabinet. The Secretary of the Finance and Administration Cabinet serves as the Chair of the Committee. Members of the Loan Committee meet and adopt policies and procedures to ensure fair and equitable treatment to all applicants.</p>
<i>Notable Program Approaches and Accomplishments:</i>	<ul style="list-style-type: none"> • Kentucky Green Bank model combines a variety of financing mechanisms to increase efficiency in state buildings: revolving loan fund, direct lending, and performance contracting. • Originally approved by the State legislature and set up in 2000 as a trust fund that could accept gifts or funding from nonstate sources. Fund authorization in place allowed the Finance and Administration Cabinet to quickly capitalize Green Bank with some \$14 million in ARRA funds, received several years later, and turn the bank into an active and successful loan program to improve the energy performance of public facilities. • Engagement with state's Energy Services Coalition (ESC) chapter, which includes approximately 12 active ESCOs. • Since inception, program has lent all of the original \$14.17 million in ARRA funds, with loan repayments revolved to recapitalize the loan pool. Loans to date have financed improvements in several agencies, including the Department of Education, Kentucky Educational Television, Finance and Administration Cabinet, Department of Veterans' Affairs, Kentucky Office of the Blind, Cabinet for Health and Family Services, and the Department of Corrections.

Massachusetts Home Energy Assistance Team (HEAT) Loan Program ³⁴	
<i>Implementing Agency:</i>	Mass Save®, in partnership with the Massachusetts Department of Energy Resources
<i>Program Type:</i>	Credit Enhancement
<i>Funding Source:</i>	Ratepayer funds
<i>Target Market(s):</i>	Residential buildings
<i>Overview:</i>	<p>Established in 2006 by the Massachusetts Department of Energy Resources (DOER), the Home Energy Assistance Team (HEAT) Loan program offers 0% interest loans from participating lenders to support the installation of qualified energy efficiency improvements in their homes. Loans are available in amounts up to \$25,000 with terms up to seven years. Loans are available for energy efficiency projects only, including attic, wall, and basement insulation; high-efficiency heating systems; high-efficiency domestic hot water systems; solar hot water systems; seven-day digital programmable thermostats; and ENERGY STAR®-qualified replacement windows.</p> <p>The HEAT Loan program buys down the interest rate on the loan by offering participating lenders the prime rate plus 1%, with a floor of 5%. The financing is available to all qualified residential customers of Cape Light Compact, Columbia Gas, National Grid, NSTAR, Unital, and Western Massachusetts Electric Company.</p> <p>HEAT Loans are offered as part of the Mass Save® program and to qualify, the customer must own a one-to-four-family residence, obtain a Mass Save® Home Energy Assessment, and install qualified energy efficiency measures recommended by a Mass Save® representative. Mass Save® is an initiative sponsored by Massachusetts's gas and electric utilities and energy efficiency services providers, which work with DOER to provide a wide range of services, incentives, trainings, and information promoting energy efficiency to residents and businesses.</p>
<i>Notable Program Approaches and Accomplishments:</i>	<ul style="list-style-type: none"> • Since 2006, both loan size and loan volume have increased, suggesting a rising rate of new participants and demand for larger loans to finance multiple energy efficiency measures. • Since 2006, cumulative issuances of HEAT loans total about \$140 million through 2012. Cost of the interest rate buy-down has been approximately \$7.8 million, or about 15.5% of the loan volume (excluding administrative costs). The credit enhancement has resulted in a 6.5:1 leverage ratio and is enabling state banks and lenders to gain experience in residential energy efficiency lending. • Offers (typically) unsecured loans at 0% interest through a network of almost 50 lenders spread out across the state, providing customers with no-cost capital to install energy efficiency measures through local lenders. For larger projects, lenders may require securing the loan with collateral at their own discretion. • Piggybacks off of the Mass Save® program and project delivery infrastructure and network, which are well-established in Massachusetts. Allows customers to participate in the loan program easily, by tapping into local programs, lenders, and contractor networks with which they may already be familiar. • The program also takes advantage of the demand generated by the need for emergency replacement for home energy equipment, such as hot water systems or heaters. Mass Save® allows lenders to pre-screen customers for a loan in case of emergency.

Michigan Saves Business Energy Financing ³⁵	
<i>Implementing Agency:</i>	Michigan Saves
<i>Program Type:</i>	Credit Enhancement
<i>Funding Source:</i>	Michigan Public Service Commission (MPSC) Grant, U.S. Department of Energy (DOE) State Energy Program (SEP)
<i>Target Market(s):</i>	Commercial buildings
<i>Overview:</i>	<p>Launched in November 2012, Michigan Saves Business Energy Financing provides a loan loss reserve to help Michigan businesses finance energy efficient lighting, heating and cooling systems, insulation, refrigeration, equipment, and other projects. Businesses make the upgrades with the help of Michigan Saves authorized contractors and Michigan Saves provides affordable financing (between \$2,000 and \$150,000 with rates from 5.9% and terms of two to five years) through a lending partner, Ervin Leasing, a private national equipment lease and finance company headquartered in Ann Arbor. A community bank, the Bank of Ann Arbor, provides capital.</p> <p>Typical improvements include lighting, HVAC, refrigeration, kitchen/cooking equipment, controls and preventative maintenance, insulation, windows, and doors. The program currently offers a promotional rate of 1.99% to businesses in the food industry, which receive a \$2,000 rebate if they undergo an energy audit and cut energy use by 20%. The financing consists of capital leases with a \$1.00 purchase option at the end of the term.</p> <p>The Business Energy Financing Program is administered by Michigan Saves, a nonprofit established in 2009 with an \$8.1 million grant from the Michigan Public Service Commission (MPSC). The organization's efforts expanded beginning in 2010 to include the Home Energy Loan Program, BetterBuildings for Michigan, Business Energy Financing, and Public Sector Energy Financing with approximately \$35 million in U.S. Department of Energy grants through the Michigan Energy Office. Michigan Saves makes easy, affordable financing available through credit enhancements available to private lenders to support financing products for residential, commercial, and municipal energy efficiency, geothermal, and solar PV projects. They also authorize and monitor a network of more than 300 contractors. Governed by a 145-member Board of Directors, including a special policy adviser appointed by the MPSC, Michigan Saves has no employees but is staffed by contract with Public Sector Consultants, a private research and management firm, and the Delta Institute, a nonprofit promoting environmentally friendly economic development in the Great Lakes region.</p>
<i>Notable Program Approaches and Accomplishments:</i>	<ul style="list-style-type: none"> • Based on available grant funding from the U.S. DOE and the MPSC, the Business Energy Financing program has \$5 million in a loan loss reserve, which is expected to leverage at least \$30 million in private sector capital. Under the current agreement with Ervin Leasing and Bank of Ann Arbor, the loss reserve funds are leveraged at a 10:1 ratio. • More than 30 business owners have taken out leases, representing almost \$1 million in investment • Program participants have the choice between two program options (arranging customized energy audit and project versus implementing pre-approved, a la carte measures), enabling businesses to tap into technical guidance or direct their own energy projects as needed. • Includes a network of 60 authorized contractors, who market the finance product, conduct audits, and install improvements. Michigan Saves also conducts training events for participating contractors.

Michigan Saves Home Energy Loan Program ³⁶	
<i>Implementing Agency:</i>	Michigan Saves
<i>Program Type:</i>	Credit Enhancement
<i>Funding Source:</i>	Michigan Public Service Commission (MPSC) Grant, U.S. Department of Energy (DOE) Energy Efficiency and Conservation Block Grant Program (EECBG)
<i>Target Market(s):</i>	Residential buildings
<i>Overview:</i>	<p>The Home Energy Loan Program provides a loan loss reserve to assist Michigan homeowners finance home energy upgrades. Michigan Saves authorized contractors' help homeowners identify improvements (based on an energy assessment or from an eligible measures list) and access the phone- or web-based Michigan Saves Loan Application Center (managed by Lending Solutions Incorporated).</p> <p>Participating lenders offer unsecured loans (between \$1,000 and \$20,000 with a fixed annual percentage rate (APR) not to exceed 7%), with no prepayment penalty. Loan terms are one year for every \$1,000 for loans up to \$4,999; for loans \$5,000 and higher, 120-month term options are available. Loans are available for owner-occupied, single-family homes, or for 1-4 unit properties where one unit is owner-occupied (rentals are not eligible). All borrowers must meet the lender's underwriting criteria, including a credit score of 640 and above and a debt-to-income ratio less than 50%.</p> <p>The program is administered by Michigan Saves, a nonprofit established in 2009 with an \$8.1 million grant from the Michigan Public Service Commission (MPSC). The organization's efforts expanded beginning in 2010 to include the Home Energy Loan Program, BetterBuildings for Michigan, Business Energy Financing, and Public Sector Energy Financing with approximately \$35 million in U.S. Department of Energy grants through the Michigan Energy Office. Michigan Saves makes easy, affordable financing available through credit enhancements available to private lenders to support financing products for residential, commercial, and municipal energy efficiency, geothermal, and solar PV projects. They also authorize and monitor a network of more than 300 contractors. Governed by a 145-member Board of Directors, including a special policy adviser appointed by the MPSC, Michigan Saves has no employees but is staffed by contract with Public Sector Consultants, a private research and management firm, and the Delta Institute, a nonprofit promoting environmentally friendly economic development in the Great Lakes region.</p>
<i>Notable Program Approaches and Accomplishments:</i>	<ul style="list-style-type: none"> • Provides 5% Loan loss reserve, leveraging lender capital at ratio of 20:1; thus, the \$3.4 million currently dedicated to the residential program provides \$68 million in loan capital. • Over 2,700 homeowners have taken out loans, representing \$22.1 million in investment. Program is now averaging \$1 million in loans per month. <p>The program uses a network of credit unions across the state, but loan applications are taken through a single application center. The application is short and streamlined, decisions are made within minutes, and approved applications are sent from the application to the appropriate credit union for closing and servicing.</p> <ul style="list-style-type: none"> • Allows homeowners to choose between two program options (undergoing energy assessment and selecting from recommended suite of improvements versus choosing from a list of pre-approved measures, including building shell improvements, HVAC upgrades, water heating measures, appliance upgrades, and renewable energy (including rooftop solar and geothermal)).

Minnesota Guaranteed Energy Savings Program (GESp) ²⁷	
<i>Implementing Agency:</i>	Minnesota Department of Commerce, Division of Energy Resources
<i>Program Type:</i>	Energy Savings Performance Contracting
<i>Funding Source:</i>	Oil overcharge funds
<i>Target Market(s):</i>	State and local buildings
<i>Overview:</i>	<p>Administered by the Minnesota Department of Commerce, Division of Energy Resources, the Guaranteed Energy Savings Program (GESp) enables energy efficiency and renewable improvements in state and local buildings through Guaranteed Energy Savings Contracts. The intent of the GESp is to maximize job creation and operational cost savings through investment in public facilities with the goal of reducing aggregate energy consumption by 20% throughout all state agencies. Launched in 2011, GESp builds on the experience of the Division of Energy Resources in energy efficiency programs and is designed to include lessons learned by other states.</p> <p>The program promotes awareness and implementation of energy efficient and renewable energy measures in public facilities by state and local governments, school districts, and institutions of higher learning; develops and administers Master Contracts for Energy Saving Performance Contracting (ESPC) services for use by public entities; pre-qualifies ESCOs for participation; and provides technical, contractual, and financial assistance to public entities seeking to leverage the State's GESp Master Contract to implement energy efficiency and renewable energy projects.</p> <p>Currently, the program's administrative and staff costs are supported with oil overcharge funds. GESp staff members assist public entities with a number of activities, including: evaluating their facilities for potential energy efficiency and renewable energy investment opportunities; analyzing the available financing options; soliciting and awarding site-specific Requests for Proposals from pre-qualified ESCOs to perform ESPC services; evaluating the technical and financial feasibility of ESCO proposals; negotiating and awarding contracts to pre-qualified ESCOs to implement Energy Conservation Measures (ECMs); providing project management oversight; and providing technical assistance to ensure the ESPC Measurement and Verification (M&V) Plan is properly performed throughout the performance period of the contract.</p>
<i>Notable Program Approaches and Accomplishments:</i>	<ul style="list-style-type: none"> • Program's use of a Joint Powers Agreement allows school districts and municipalities to opt-in to the program and take advantage of the state's Master Contract for ESPC. • Department of Commerce holds master contracts with 11 pre-qualified ESCOs, which help market the program to various state and local building managers, in conjunction with Energy Services Coalition Minnesota Chapter Outreach Committee. • GESp is supported by an April 2011 Executive Order, which tasked the Department of Commerce with convening an Energy Services Coalition Minnesota Chapter to establish voluntary standards, best practices, educational resources, and outreach strategies to advance state and local government utilization of ESPC, and with creating and staffing an "Office of Guaranteed Energy Savings Programs" to offer technical assistance for state agencies, local government, and school districts, as well as with developing a proposal for creating ongoing funding for the office (i.e., through a fee-for-service model).

Nebraska Dollar and Energy Savings Loan Program³⁸	
<i>Implementing Agency:</i>	Nebraska Energy Office
<i>Program Type:</i>	Revolving Loan Fund
<i>Funding Source:</i>	Petroleum Violation Escrow funds, State Energy Program (SEP), American Recovery and Reinvestment (ARRA) SEP, Nebraska Public Power District (NPPD) funds, other state funds (total \$38 million)
<i>Target Market(s):</i>	Residential, Commercial, Industrial, MUSH, Agriculture, Alternative Fuel, Business and Nonprofit, Telecommunications, Renewable Energy (Wind, Solar, & Fuel Cell Systems), and Waste Minimization
<i>Overview:</i>	<p>Administered by the Nebraska Energy Office (NEO), the Dollar and Energy Saving Loan Program is a revolving fund that reduces the interest rate for energy-related projects meeting minimum efficiency standards. Active since 1990, it is one of the longest standing and highest volume energy efficiency loan programs in the country. It was created with \$10 million in petroleum violation escrow (PVE) funds with an additional \$15 million in PVE, state, trust, and State Energy Program competitive grant funds added over time. In 2010, NEO routed \$12.6 million in American Recovery and Reinvestment Act (ARRA) funds, bringing the total loan pool today to approximately \$38 million as of July 2013.</p> <p>Participating Nebraska lenders issue loans for energy efficiency to borrowers. NEO then purchases 50%, 65%, or 75% of each loan at 0% interest to deliver an interest rate of 5%, 3.5%, or 2.5%, respectively, to the borrower. This allows the bank to retain a 10% return on its share of the loan. The portion of the loan purchased by NEO is decided by the rate offered to the borrower by the lender.</p> <p>The program lends to all sectors, including the residential, commercial and industrial, and public sectors; however, the large majority of its loans are issued to residential homeowners. A wide variety of ENERGY STAR-certified appliances are eligible expenditures, including clothes washers, dishwashers, water heaters, and lighting. It also provides loans for a variety of other energy efficiency measures such as insulation, energy-efficient doors, and duct sealing, as available on NEO's list of pre-qualified measures. In some cases, the state will approve loans for measures that are not on the list, if the borrower has performed an energy audit.</p>
<i>Notable Program Approaches and Accomplishments:</i>	<ul style="list-style-type: none"> • As of June 2013, program's \$38 million loan pool financed nearly 28,000 projects totaling \$294 million, creating a 7:1 leverage ratio of private to public capital. • As of June 2012, the total default cost to the state was \$106,200, or 0.001%. • Blended interest rate model has attracted lender participation and promoted longevity of program. More than 265 lenders operating at over 900 locations across the state (including bankers' associations, credit unions, and other savings institutions) are qualified to offer Dollar and Energy Saving loans. Lenders are viewed by NEO as key marketers of program. • Flexible, adaptable program accommodates technological advances, as loan requirements and project criteria have increased as commercially available technologies become more energy-efficient. • Program has attracted utilities: NPPD, which covers a large service territory within the state, infused \$1 million into the loan program (matched by another \$2 million from NEO and \$1 million from lenders) for customers to install efficient heat pumps at 2.5% interest. • To assure quality, NEO inspects 10%-15% of the projects annual to ensure satisfactory project completion. • Program operating revenue generated from interest accrued on idle funds, which are considered to be trust funds under the control of the governor. At times, the revenue is used to expand the loan pool.

New Mexico Clean Energy Revenue Bond Program ³⁹	
<i>Implementing Agency:</i>	Energy Conservation and Management Division of the New Mexico Energy, Minerals, and Natural Resources Department, in partnership with the New Mexico Finance Authority
<i>Program Type:</i>	Revenue Bonds
<i>Funding Source:</i>	New Mexico Gross Receipts Tax (up to \$20 million par value outstanding)
<i>Target Market(s):</i>	State buildings and public school districts
<i>Overview:</i>	<p>New Mexico's Clean Energy Revenue Bond program, enacted as part of the Energy Efficiency and Renewable Energy Bonding Act approved in 2005, authorizes up to \$20 million in bond financing to state agencies and public school districts to cut utility bills and reduce energy use. The program provides financing for up-front costs and bond repayments, allowing agencies and schools to devote less money to utilities and more toward their mission. The Energy Conservation and Management Division of the Energy, Minerals, and Natural Resources Department (EMNRD) administers the program.</p> <p>The EMNRD works with participating state agencies and public schools to obtain an investment-grade energy audit and to select measures for financing. Each measure recommended within the energy audit must pay for itself within the useful life of the improvement. The agency or district follows a process developed by EMNRD to select a contractor to design, install, monitor, and maintain energy efficiency measures in its buildings, as identified in the energy audit. EMNRD works with the agency or district through implementation, commissioning, monitoring, and verification to ensure the quality of the project.</p> <p>The financing package is based on the projected cash flow of the measures, less 10%, which is kept by the agency or school district as a cash flow cushion. The length of the bond financing cannot exceed the expected useful life of the measures. The remaining 90% savings is captured to pay off the financing. The Clean Energy Revenue Bonds are issued and purchased by the New Mexico Finance Authority through its Public Project Revolving Fund (PPRF), which has a triple-A credit rating. NMFA issues Clean Energy Revenue Bonds not to exceed 90% of the savings certified by the audit.</p>
<i>Notable Program Approaches and Accomplishments:</i>	<ul style="list-style-type: none"> • Bonds are secured by the State's Gross Receipts Tax, which enjoys a high credit rating. • State recoups its cost of debt service on the Clean Energy Revenue Bonds by reducing the agency's or public school district's budget; reduction is equal to or less than 90% of the savings from the energy measures, thereby leaving the remaining 10% with the agency or public school district as an incentive and protective cash flow cushion. • State agency partnership between EMNRD and NMFA allows program to combine different areas of expertise. EMNRD provides staff time (including three in-house engineers) to provide technical assistance and audit review; NMFA structures the Clean Energy Revenue Bonds and takes them forward to the NMFA Board of Directors to get approval on financing. NMFA combines program loans with other state capital improvement loans for bond issuance, using PPRF for streamlined funding and financing.

New York Green Jobs, Green New York On-Bill Recovery Financing Program ⁴⁰	
<i>Implementing Agency:</i>	New York State Energy Research and Development Authority (NYSERDA)
<i>Program Type:</i>	On-Bill
<i>Funding Source:</i>	Ratepayer funds, Regional Greenhouse Gas Initiative (RGGI) proceeds
<i>Target Market(s):</i>	Residential and small commercial/multifamily buildings
<i>Overview:</i>	<p>The Power New York Act of 2011 (A. 8510/S.5844) established an on-bill recovery charge for repayment of loans for efficiency improvements through the Green Jobs, Green New York (GJGNY) initiative. The on-bill recovery structure supplements technical assistance and financial incentives offered through energy efficiency programs administered statewide by NYSERDA.</p> <p>The on-bill recovery program covers residential, small business/nonprofit, and multifamily properties statewide through seven utility companies (Central Hudson, Con Edison, NYSEG, National Grid, Orange & Rockland, Rochester Gas & Electric, and Long Island Power Authority). While the program covers electric, gas, and/or heating fuel energy efficiency measures, the charge is placed on the electric bill, unless the majority of savings result from gas measures, in which case the charge is placed on the gas bill. The annual loan repayment installment charges may not exceed the anticipated average annual energy savings from all fuel sources (including 0.8% annual rate escalation factor) during the repayment term. The program allows for loan amounts of up to \$25,000 (currently the average loan size is \$9,200) with an interest rate of 3.49% as of January 1, 2013 (2.99% earlier in the program) and loan terms of 5, 10, or 15 years. The borrower(s) must be the owner of the property and at least one of the borrowers must be named on the utility account. Nonpayment of the charge will subject the customer to termination of utility service in the same manner as nonpayment of utility service charges, following the same regulatory consumer safeguards.</p>
<i>Notable Program Approaches and Accomplishments:</i>	<ul style="list-style-type: none"> • To participate, property must undergo a comprehensive Home Performance with ENERGY STAR (HPwES) home energy assessment performed by a certified contractor. New York has a well-established HPwES program using a statewide network of independent home improvement contractors, accredited by the Building Performance Institute (BPI) and trained to identify efficiency opportunities using a “whole house” approach. • On-bill recovery charge survives changes in ownership, so obligation can (but is not required) to “stay with the meter;” arrears at the time of transfer are the responsibility of the seller. Seller must provide written notice to a prospective purchaser prior to sale and sign a Declaration, which is recorded in the same manner as a mortgage, to ensure prospective purchasers of the property are notified of the provisions of the charge on the meter. Neither the loan nor the Declaration represents a lien on the property. • Through interagency collaboration with the Department of Financial Services and engagement with utilities, authorizing legislation and program features have undergone changes to better comply with federal mortgage rules and to alleviate utility concerns. (On the latter point, NYSERDA has allocated \$900,000 among the utility as reimbursement for the costs of modifying billing systems to accommodate on-bill recovery charges, and pays a 1% fee on each loan to defray utility administrative costs.) • As of November 2012, the program had closed and issued 376 loans, with another 239 approved and awaiting project completion and 486 preapproved, together totaling approximately \$11 million in capital. • In August 2013, NYSERDA completed a sale of a portfolio of on-bill recovery and direct loans in the form of a taxable Qualified Energy Conservation Bond issuance, marking an important step in creating a secondary bond market for residential on-bill loans in the state.

Ohio Energy Loan Fund ⁴¹	
<i>Implementing Agency:</i>	Ohio Development Service Agency's Office of Energy
<i>Program Type:</i>	Revolving Loan Fund
<i>Funding Source:</i>	State Energy Program (SEP), Utility rider payments, American Recovery and Reinvestment funds
<i>Target Market(s):</i>	Commercial and Industrial Facilities
<i>Overview:</i>	<p>Launched in January 2012, the Energy Loan Fund is administered by the Ohio Development Services Agency's Office of Energy. This loan pool combines funding from several different sources, including annual State Energy Program (SEP) appropriations, utility rider payments (expired 2010), and unobligated American Recovery and Reinvestment Act (ARRA) funds. The program is available to small businesses, manufacturers, nonprofits, and public entities. Ohio manufacturers that have participated in the Energy Efficiency Program for Manufacturers (EPPM) are eligible for low-cost financing through this loan fund. The EPPM is a multiphase energy saving program that provides facilitation, including energy management planning and technical opportunity assessment, and financial assistance to Ohio manufacturers through the Office of Energy, enabling manufacturers to diagnose, plan, and implement cost-effective energy improvements at their facilities.</p> <p>Loans offered to businesses and manufacturers through the Energy Loan Fund may finance up to 80% of the eligible costs of the project, with a 20% cost share; nonprofits and public entities may finance up to 90%, with a 10% cost share. The interest rate is equal to or below the prime interest rate.</p>
<i>Notable Program Approaches and Accomplishments:</i>	<ul style="list-style-type: none"> • Previously, EPPM included a grant component rather than a loan; however, the Office of Energy restructured its programs to create the Energy Loan Fund, which serves as an umbrella fund under which a number of different technologies are eligible for financing (provided they demonstrate a 15% reduction in electricity and/or gas usage). New revolving loan model has allowed the Office of Energy to meet higher demand for projects without exhausting state coffers on grants and subsidies. • Financing option is embedded within the EPPM, which provides a multistep framework for manufacturers to diagnose inefficiencies in their facility, develop an energy management plan in tandem with certified engineers, implement the project, and conduct measurement and verification (M&V) of the installed measures. Facilitators, assigned to each company by the Office of Energy, walk participating companies through the EPPM and financing process, enabling companies with limited technical expertise to understand and participate easily in the program. The facilitators also serve as a mechanism to relay feedback and customer experiences to the Office of Energy. • The Office of Energy closely monitors projects to ensure quality and repayment, with an added focus on data collection and publication of case studies to promote expanded program participation and create demand for the financing. • The Office of Energy provides technical assistance to program participants by coordinating with the state's Industrial Assessment Center (IAC), which is funded by DOE and located at the University of Dayton.

Oregon State Energy Loan Program (SELP)⁴²

<i>Implementing Agency:</i>	Oregon Department of Energy (ODOE)
<i>Program Type:</i>	Bond Program
<i>Funding Source:</i>	Bond authority (unlimited)
<i>Target Market(s):</i>	All sectors
<i>Overview:</i>	<p>Administered by the Oregon Department of Energy (ODOE), the State Energy Loan Program (also sometimes called the Small-Scale Energy Loan Program, or SELP) aims to promote energy conservation and renewable energy resource development by offering low-interest loans for projects that save energy; produce energy from renewable resources; use recycled materials to create products; or use alternative fuels. The program provides loans to individuals, businesses, schools, cities, counties, special districts, state and federal agencies, public corporations, cooperatives, tribes and nonprofits for projects that are implemented within the state of Oregon.</p> <p>SELP loans are secured with real estate collateral as security, but may also require equipment, inventory, accounts, and other forms of collateral in special cases. The size of loans generally ranges from \$20,000 to \$20 million over a term of five to 20 years. SELP offers construction financing on a case-by-case basis.</p> <p>SELP was initiated in 1981 after voters approved its creation through a constitutional amendment authorizing the sale of bonds to finance small-scale, local energy projects. The sale of general obligation bonds is made on a periodic basis once the loan volume for approved projects reaches critical mass (normally at least \$10 million). Although ODOE also possesses revenue bond authority, it has not yet chosen to issue revenue bonds for this program. Rates vary depending on the borrower, the bond market, the term of the loan, timing of the project, and the availability of funds.</p>
<i>Notable Program Approaches and Accomplishments:</i>	<ul style="list-style-type: none"> • One of longest-running programs and most successful in country: as of December 2013, SELP had issued 207 taxable loans totaling \$212,554,299 and 652 tax-exempt loans totaling \$379,293,359; of 859 loans representing \$591,847,658 issued over 31 years, ODOE has had five defaults. • SELP bond financing is combined a self-sufficient revolving loan fund, with staff time and administrative costs covered primarily through program fees and interest margins. • To reduce the waiting time between project approval and bond issuance (which typically requires a bundle of at least \$10 million in projects), ODOE established a line of credit that can be used to launch approved projects immediately. • Both public sector and private sector projects have attractive financing terms: public sector projects are financed at a tax-exempt rate (typically 150 basis points over Treasury bond yield) and private sector projects are financed at the taxable rate (generally 550 to 750 basis points above Treasury bond yield). • Loan applications go through rigorous approval process. SELP Advisory Committee (SELPAC) convened by ODOE represents wide variety of sectors (agriculture, manufacturing, realty, municipal government, banking, utilities, architecture, and data warehousing), and is responsible for reviewing large (+\$100,000) project applications. • Strong emphasis on marketing, leveraging publications of case studies, speaking engagements, and targeted outreach through key partners such as the Energy Trust of Oregon and Clean Energy Works Oregon.

Pennsylvania Keystone Home Energy Loan Program (HELP)⁴³

<i>Implementing Agency:</i>	Pennsylvania Treasury Department, in partnership with AFC First Financial Corporation
<i>Program Type:</i>	Public-Private Partnership
<i>Funding Source:</i>	State funds (Treasury, Pennsylvania Housing Agency, Pennsylvania Department of Environmental Protection), private capital (AFC First), American Recovery and Reinvestment Act (ARRA) funds
<i>Target Market(s):</i>	Residential
<i>Overview:</i>	<p>Created in 2006 by the Pennsylvania Treasury Department and AFC First Financial Corporation of Allentown, the Keystone Home Energy Loan Program (Keystone HELP) offers affordable, 100% point-of-purchase financing options for Pennsylvania homeowners to purchase and have installed energy-efficient equipment or to implement whole-house improvements. In addition to administering Keystone HELP, AFC First operates residential energy efficiency lending programs nationally, is one of three lenders in the country approved by Fannie Mae to offer Energy Loans, and is also the country's first private, nonutility Home Performance with ENERGY STAR (HPwES) sponsor.</p> <p>AFC First and the West Penn Power Sustainable Energy Fund (WPPSEF) started Keystone HELP as a regional program in 2005. In 2006 Pennsylvania Treasury provided the support to expand the unsecured loan program statewide. In 2008, the Pennsylvania Housing Finance Agency provided funding to add a secured loan program. In 2009, the program expanded with support funds from the State Energy Office, the Pennsylvania Department of Environmental Protection (DEP), under the state's Alternative Energy Investment Act. In 2011, the program expanded again with federal American Recovery and Reinvestment Act (ARRA) funds.</p> <p>Administered under AFC First's sponsorship, Keystone HELP functions as the state's Home Performance with ENERGYSTAR (HPwES) program. Keystone HELP is also a partnering organization of EnergyWorks, a program developed by the Metropolitan Caucus (a coalition of Commissioners and Council members from Bucks, Chester, Delaware, and Montgomery Counties and the Mayor of Philadelphia) and supported by a grant from the U.S. Department of Energy's (DOE) Better Buildings Program. EnergyWorks provides federal subsidies that make Keystone HELP loans available at even lower interest rates to customers in the Greater Philadelphia Area.</p>
<i>Notable Program Approaches and Accomplishments:</i>	<ul style="list-style-type: none"> • In March 2013, Treasury completed a \$31.3 million loan sale through a consortium of three banks (Fox Chase Bank, WSFS Bank, and National Penn Bank), marking a milestone in the establishment of secondary market financing for residential efficiency loans. • Treasury has partnered with NASEO, the Energy Programs Consortium, and Renewable Funding to develop the Warehouse for Energy Efficiency Loans (WHEEL), which creates a national loan aggregation facility that can help stimulate a secondary market to finance state and local government and utility-sponsored residential energy efficiency loan programs. Once underway, WHEEL will enable Keystone HELP loans to be leveraged significantly with private capital and expand the impact of the program • Loans plug into the state's Home Performance with ENERGY STAR program, linking customers with BPI-certified architects, contractors and auditors with specific expertise in ENERGY STAR construction, retrofit, and auditing standards. • Emphasis on quality control and assurance: AFC First pre-authorizes auditors and contractors to participate in the program, and provides marketing and sales training and tools. Contractors are paid upon satisfactory completion of the work, verified by AFC First through direct contact with customers before payment is issued.

South Carolina Help My House On-Bill Financing Pilot⁴⁴

Implementing Agency:	Central Electric Power Cooperative, in partnership with the Electric Cooperatives of South Carolina
Program Type:	On-Bill Financing
Funding Source:	U.S. Department of Agriculture (USDA) Rural Utility Service (RUS) loan (\$740,000)
Target Market(s):	Residential
Overview:	<p>Through the “Help My House” pilot program, electric cooperatives in South Carolina explored combining demand-side management (DSM) measures with energy efficiency programs to offset the need for new generation.</p> <p>From June 2011 to February 2012, the pilot allowed homeowners (members) of participating electric cooperatives (co-ops) in the state of South Carolina to borrow money at 2.5% interest for energy improvements to their homes and to repay the loan as part of their electric bills. Pilot program consumer loans were funded primarily with a \$740,000 loan issued at 0% interest from the U.S. Department of Agriculture (USDA) Rural Utility Service (RUS), through the Rural Economic Development Loans and Grants (REDL&G) program.</p> <p>Central Electric Power Cooperative (Central), in partnership with the Electric Cooperatives of South Carolina (ECSC), implemented the Help My House pilot program and together invested more than \$1.5 million to cover administrative and operational expenses. Central hired Ecova, a firm specializing in utility energy efficiency programs, to lead the development and implementation of the pilot plan and manage the staff through the implementation of the pilot. Over the course of the pilot, eight co-ops participated and 125 homes were weatherized (over half of these were manufactured housing).</p> <p>South Carolina’s on-bill financing programs are supported by Section 58-37-50 of the South Carolina Code of Laws, which passed in 2010 and allows all utilities in the state to lend to their members. The bill allows utilities to disconnect service if loans are not repaid. Under this structure, loans are tied to the meter, so that the loan stays with the home and is passed along to the next owner or tenant in case of turnover. The legislation also eliminates the need for credit checks, but does require bookend energy audits to Building Performance Institute (BPI) standards.</p>
Notable Program Approaches and Accomplishments:	<ul style="list-style-type: none"> • Targeted marketing and recruitment used utility bill analytics to identify homes that were in particular need of efficiency financing and improvements, implemented through consumer-friendly program brochures and co-op staff. • By end of pilot period, 125 homes retrofitted (53 single family detached, 72 mobile homes), surpassing the program goal by 25%. The average loan was more than \$7,684, with an average projected simple payback of 6.6 years and a net projected annual savings of \$288 per home. The average home cut electricity use by 34%. • Data-driven project with key research objectives to prepare for a possible full-scale program; more than 350 data points were collected on each participating home. • Post-pilot debrief with contractors and participating co-ops revealed positive feedback for program design, implementation, and customer satisfaction.

Tennessee Pathway Lending Energy Efficiency Loan Program⁴⁵

Implementing Agency:	Pathway Lending, in partnership with Tennessee Department of Environment & Conservation Office of Energy Programs
Program Type:	Revolving Loan Fund
Funding Source:	State petroleum violation escrow (PVE) funds, Tennessee Valley Authority (TVA) forgivable loan, private capital (Pinnacle National Bank and Pathway Lending) (total \$50 million)
Target Market(s):	Commercial and industrial
Overview:	<p>Pathway Lending's Energy Efficiency Loan Program was launched in 2010 in collaboration with the Tennessee Valley Authority (TVA), the State of Tennessee, and Pinnacle National Bank. It is operated by Pathway Lending, which is a nonprofit economic development lender. This \$50 million loan program is capitalized by a \$15 million grant from the state through petroleum violation escrow (PVE) funds; \$15 million from TVA; a \$15 million line of credit from Pinnacle; and \$5 million from Pathway Lending. It provides Tennessee business and nonprofit entities with below-market-rate loans for energy efficiency and renewable energy improvements.</p> <p>The program offers loans from \$20,000 to \$5 million. Eligible projects include lighting, HVAC, building retrofits, industrial systems, co-generation, and renewable energy/solar projects. As of June 30, 2013, the program offers a fixed interest rate of 2% up to a five-year term and 5% for five- to 10-year terms. All costs related to the efficiency measures may be financed, including loan fees, assessments, design, equipment and installation. Payment terms may not exceed 10 years.</p>
Notable Program Approaches and Accomplishments:	<ul style="list-style-type: none"> • Program design is self-sustaining through the use of a revolving loan fund with Pathway staff time covered through interest payments, requiring no additional funding from either the state or the private partners. • Partnership with TVA provides technical assistance to customers served by a TVA distributor through a Trade Ally program that delivers energy efficiency products and installation. • Office of Energy Programs oversees program and assists Pathway Lending in promoting the financing opportunity through their website, promotional materials, consultations with consumers, and speaking engagements. • Program participation is streamlined, with approval decisions made for qualifying loans less than \$200,000 within 24 hours of application submission, option for loan recipients to finance program fees or other costs, assignment of a dedicated Pathway Lending Associate to each recipient, and transparency of loan application and underwriting criteria.

Texas Loans to Save Taxes and Resources (LoanSTAR) Program⁴⁶

Implementing Agency:	Texas State Energy Conservation Office (SECO)
Program Type:	Revolving Loan Fund
Funding Source:	State petroleum violation escrow (PVE) funds, American Recovery and Reinvestment Act (ARRA) funds (total \$162 million)
Target Market(s):	Public buildings
Overview:	<p>The Texas LoanSTAR Program uses a revolving loan mechanism to issue loans targeted for public buildings, including state agencies, school districts, higher education, local governments, and hospitals. The program was initiated and is administered by the Texas Energy Office (now the State Energy Conservation Office, or SECO) in 1988 and was approved by the U.S. Department of Energy (DOE) as a statewide energy efficiency demonstration program. It began with \$90 million from petroleum violation escrow (PVE) funds, and added about \$72 million from the American Recovery and Reinvestment Act (ARRA).</p> <p>Loans are offered at attractive interest rates, varying by solicitation and ranging from 2% to 4% depending on current market rates. Three different types of borrower-vendor contracting mechanisms are approved for LoanSTAR financing, including design/bid/build projects, design/build retrofits, and energy saving performance contracting (ESPC), as approved in 2001 by DOE.</p> <p>SECO has introduced changes to the LoanSTAR Program since inception. Initially, loans had to pay back within four years and all major projects had to be metered and monitored for savings verification. In 1995, the loan period was lengthened to eight years and metering and monitoring became an option for the loan recipient, with the cost allowed to be rolled into the loan. In 2001, the payback period extended once again to the current 10-year maximum loan term. In addition to the 10-year maximum loan term, each energy cost reduction measure must have a payback period less than the estimated useful life of that measure.</p>
Notable Program Approaches and Accomplishments:	<ul style="list-style-type: none"> • Program procedures and guidelines focus on quality control to ensure that LoanSTAR-financed projects have a strong return on investment, including development of technical Energy Assessment Report guidelines; training of energy engineering consulting firms on audit techniques and the program guidelines; development of protocols to meter and monitor each project for pre- and post-retrofit energy consumption data; and methods to analyze energy savings from retrofits. • Program has funded more than 233 loans, totaling over \$338 million and representing a total cumulative program energy savings of over . SECO has not yet seen a default on loan repayments. • LoanSTAR is SECO's largest and most visible program, using a revolving loan fund model to continue serving the public sector and generating revenue through the interest payments for program support.

Vermont Residential Property Assessed Clean Energy (PACE) Program⁴⁷

Implementing Agency:	Efficiency Vermont, in partnership with Vermont Energy Investment Corporation
Program Type:	Property Assessed Clean Energy
Funding Source:	Private capital (local program financiers and participating homeowners), Regional Greenhouse Gas Emission (RGGI) funds
Target Market(s):	Residential buildings
Overview:	<p>Launched in January 2013, Vermont's Residential Property Assessed Clean Energy (PACE) Program offers financing for energy efficiency and renewable energy improvements in small (up to four-unit), owner-occupied residential properties through an assessment on their property. The key provisions of Vermont's PACE-enabling law (Vermont Statute Title 24, Chapter 87, Subchapter 2) are as follows:</p> <ul style="list-style-type: none"> • Municipalities are authorized to create and secure debt for a PACE program if they choose, and to secure funding to pay for EE and RE projects; • Participating property owners pay for the benefit over a period of up to 20 years through a special assessment charged on their property; • Participating municipalities may join together to obtain funding more cost effectively; • Participating property owners must contribute to a loan loss reserve fund; • Nonparticipating property owners have no obligation to pay for any of the costs of a PACE district; • The maximum amount that can be financed is 15% of the assessed value of the property, capped at \$30,000; and • The total amount financed by PACE plus any outstanding mortgages on the property cannot exceed 90% of the assessed value • PACE assessments are subordinate to property taxes, and to any mortgages in place when the assessment lien is attached. In the event of refinancing, the PACE assessment is always subordinate to a first mortgage. <p>Efficiency Vermont, a statewide energy efficiency utility operated by the Vermont Energy Investment Corporation (VEIC), works with a credit facility to accept PACE applications from customers during up to three subscription periods per year. Anyone approved receives a fixed interest rate based on the current market rate for the life of the assessment. Efficiency Vermont is available to act as the PACE administrator at no cost for towns, and all costs are paid by participating property owners. The state maintains a statewide loan loss reserve of 5% up to \$1 million, capitalized by Regional Greenhouse Gas Emissions (RGGI) funds. Another account, a mandatory reserve account, is maintained at 2% and is funded from participating property owners.</p>
Notable Program Approaches and Accomplishments:	<ul style="list-style-type: none"> • As of October 2012, 45 municipalities passed local ordinances enabling establishment of PACE programs, with 28 municipalities signing on to have Efficiency Vermont serve as their PACE administrator. • Program features adapted in response to legal and administrative concerns. In response to federal blockage of residential PACE, program mimics structure of HUD's PowerSaver program (whereby the lien is junior to the existing mortgage on the property) to avoid running up against the Federal Housing Finance Authority's ruling prohibiting Fannie Mae and Freddie Mac from purchasing mortgages on properties with senior PACE liens. To address the concerns of town clerks, assessment is processed outside of the town clerk's office, and is mailed to participating property owners simultaneously with but separately from taxes. • Includes \$1 million reserve account, allowing a total of \$20 million in PACE financing and covering losses in case of property foreclosure. • Taps into a statewide energy efficiency project delivery network through Home Performance with ENERGY STAR (HPwES), taking advantages of existing utility, contractor, and lender networks in the state.

Virginia Commonwealth Energy Fund⁴⁸

Implementing Agency: Center for Innovative Technology (CIT), in partnership with the Virginia Department of Mines, Minerals, and Energy (DMME) Energy Division

Program Type: Revolving Loan Fund

Funding Source: American Recovery and Reinvestment Act (ARRA) State Energy Program (SEP) funds (\$2.6 million)

Target Market(s): Commercial

Overview: Virginia's Department of Mines, Minerals, and Energy (DMME) and the Center for Innovative Technology (CIT) launched the Commonwealth Energy Fund (CEF) in 2011 to make loans to high-growth potential early stage Virginia companies capable of driving job creation, reducing energy consumption, increasing energy generation from renewable resources, and reducing greenhouse gas emissions. DMME capitalized the CEF with funds from the U.S. Department of Energy's (DOE) State Energy Program (SEP). CIT, the third-party administrator, is a nonprofit corporation established in 1985 to develop next-generation technologies and technology companies in Virginia. The CEF targets companies with high growth potential using "commercial-ready" (as defined by the U.S. Department of Energy [DOE]) technologies strategic to Virginia's energy goals. The loans offered by CEF are typically offered to close the "gap" in a total financing package for a company.

The CEF is distinct from conventional loan programs in a number of ways. It draws on the expertise of a private sector investment committee (the CEF Investment Advisory Board) to make all investment decisions. It finances portfolio companies using an optional convertible debt structure. This vehicle permits the exchange of debt for stock in selected portfolio companies and enables the CEF to implement a "blended investment" strategy. It allows near-term debt recovery from some companies while capturing the economic rewards of ownership from companies on a higher growth trajectory. This maximizes financial return to the fund and increases the pool of available capital for future loans.

DMME describes this loan program as a "near-equity" investment program, in that it initiates as debt and converts downstream to equity, at CIT's option. Loans can be converted in several ways: they can be paid back just like a typical loan; they can undergo a liquidity event; or they can be converted into equity held by CIT.

Notable Program Approaches and Accomplishments:

- Loan recipients receive not only financing but strategic business assistance through CEF's active approach to investment and portfolio management. The CIT advises and mentors each firm on strategic business and technology development issues; demands a high level of accountability and stringent reporting requirements; and takes a "board observer" role in working with senior management and other third-party investors.
- Loan reporting requirements demand a level of accountability for performance typically reserved for venture capital investments.
- Evaluation of 300+ filtered down to six portfolio loans to promising Virginia companies.
- Stimulate private investment into the CEF portfolio. It is too early to expect CEF to match the average leveraging performance of the long-established CIT fund family, but that impressive 14:1 ratio of private to public dollars was a key factor in the decision to establish CEF within the CIT fund family.
- Public-private partnership between DMME and CIT was critical to launch and implement the program, as the CIT was able to bring to the table financial expertise and resources that an Energy Office may not typically possess.

Wisconsin Energy Bond Fund and Performance Contracting Program⁴⁹

Implementing Agency:	Wisconsin Department of Administration (DOA)
Program Type:	Bond program, Energy savings performance contracting
Funding Source:	Bond authority (up to \$200 million)
Target Market(s):	State facilities and universities
Overview:	<p>Since 2008, the Wisconsin Department of Administration (DOA) has operated the state's energy bond fund, which provides financing for energy savings performance contracting (ESPC) projects across all state facilities owned by agencies (including universities) that opt-in to the program. The fund is capitalized at a total of \$200 million and has received funding in three waves from the state legislature: \$30 million, \$50 million, \$100 million, and \$20 million. The bonding has a maximum term of 20 years and with a 5.25% interest rate and 3% energy inflation, projects must meet a 16-year simple payback.</p> <p>The bond fund supports the Performance Contracting Program administered by the Wisconsin Division of Facilities Development (DFD), which is part of the DOA. This program provides a method for the DOA to enter into a contract with a qualified energy service company (ESCO) on behalf of a state agency for development, implementation, verification, and repayment of one or more cost savings measures. Agencies benefit through reduced overall energy costs, improved facilities, and a reduction in energy consumption.</p> <p>Since 2008, DOA has prequalified 14 ESCOs to work with agencies to identify energy conservation measures (ECMs) and have them implemented with no upfront capital expenditures. The expenses are paid through the energy savings that result. Energy bills are guaranteed by the ESCO to be reduced and the savings realized are drawn from the agency's utility account to pay back the bonds that financed this effort. This agreement may last over a term not to exceed 20 years, which is the maximum bonding capability for energy efficiency work.</p>
Notable Program Approaches and Accomplishments:	<ul style="list-style-type: none"> • In response to increasing demand, state legislature has granted the program increasing levels of bond authority. • Emphasis on documentation and data collection to demonstrate that performance guarantees are met and taxpayer funds are used effectively. • Close partnership with DFD, the ESCO, and the agency interested in installing energy measures: ESCO and DOA provide quality assurance, project negotiation, and overall project management; participating agency manages the initial ESCO selection, coordinates site access during audits, may assist in construction coordination, and assumes measurement and verification (M&V) after an initial M&V/commissioning period, with technical assistance from DOA as requested. • To reduce waiting time between project approval and bond issuance, DOA borrows through the Capitol Budget Office (CBO) on a monthly basis, allowing projects to be financed upfront with general revenue and, after bond issuance, DOA compensates the CBO typically at a 4% average interest rate. • To address project risk, project proposals undergo significant DOA review for technical and financial soundness; University projects must be approved by Board of Regents; all projects over \$150,000 must be approved by the State Building Commission; largest projects require Governor's approval. • Targeted marketing to the University of Wisconsin system and the Department of Corrections, which together account for 85% of the state's energy consumption. Current major projects at the University of Wisconsin Madison, Milwaukee, Oshkosh, Platteville, Eau Claire, and numerous other campuses or state institutions, and six of the 11 largest correctional institutions have initiated audits as part of this program.

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