Energy Efficiency Finance 101: Understanding the Marketplace

Joel Freehling, Shaw Environmental

August 2011

An ACEEE White Paper

529 14th Street, N.W., Suite 600, Washington, D.C. 20045
(202) 507-4000 phone, (202) 429-2248 fax, aceee.org

Contents

FOREWARD

This paper is part of a series being issued to facilitate improved energy efficiency financing programs that substantially increase the implementation of energy efficiency projects in the residential and commercial sectors. The goal of this series is to provide a set of tools that make it easier for states, municipalities, utilities, and private lenders to learn from past experience and offer effective energy efficiency programs going forward—programs that can provide capital to increase the pace of residential and commercial building energy efficiency implementation. The work was undertaken under contract with Argonne National Laboratory, with funding from the U.S. Department of Energy.

This particular paper is designed to provide an "Energy Efficiency 101" introduction to the field of energy efficiency finance, designed for those who are new to the field or for those who want a quick "refresher." It was written by Joel Freehling, a finance expert currently with Shaw Environmental and previously with ShoreBank. Also in this series are *What Have We Learned from Energy Efficiency Financing Programs*, a review of experience and lessons learned from 18 different energy efficiency programs, and a forthcoming in-depth look at on-bill financing and ways to address some of the unique opportunities and challenges of this financing approach. These last two target energy efficiency program planners and implementers.

We hope you find this series useful. We welcome your feedback on it and on what other steps ACEEE should consider for encouraging increased use of energy efficiency finance.

ABSTRACT

The number and diversity of energy finance programs have increased dramatically in recent years. Likewise, there is a growing interest among different types of financial institutions in participating in local initiatives. However, finding a financial partner that best fits a particular program can be a challenge. This paper attempts to catalogue the different categories of institutions in the marketplace so that readers will be more equipped to determine which type may offer the best fit for a local initiative. In addition, the paper offers descriptions of the different types of loan structures and mechanisms most often used in energy finance.

INTRODUCTION

Shaw Environmental and Infrastructure, as sub-contractor to the American Council for an Energy-Efficient Economy, was tasked by Argonne National Labs to investigate the approaches being deployed in regional and community energy efficiency finance programs across the country. The purpose of the scan was to examine the types of financial institutions involved in energy finance, catalogue the different financing models being developed and implemented, capture lessons learned and pitfalls to be avoided, and explore the gaps not currently being served (well) by the marketplace. We begin with a narrative scan, and at the end of this paper provide a table summarizing the discussion.

SCAN OF FINANCIAL INTERMEDIARIES IN THE ENERGY FINANCE MARKETPLACE

The number of energy finance programs and program designs has multiplied due to the significant increase in funding for finance programs through the American Recovery and Reinvestment Act (ARRA), the Regional Greenhouse Gas Initiative program (RGGI—an initiative operated by states in the Northeast U.S.), and utility-led energy efficiency programs.

As a result of this proliferation in finance programs, initiatives exist for nearly every type of residential and commercial building and every manner of ownership structure; in addition, there are a growing number of intermediaries in the energy finance field to help reach these different customer segments. The analysis of the field offered below is not meant to catalogue the entirety of the industry, given its enormity and quickly evolving nature, but merely to provide a fuller picture of the field than is typically given in policy papers or is listed in the Database of State Incentives for Renewables and Efficiency (DSIRE—http://www.dsireusa.org/). The hope is that by better cataloguing the range of intermediaries and structures, the breadth, size, and limitations of the energy finance sector will be better understood.

Commercial Banking Sector

While the number of energy finance programs has grown significantly, commercial banks have not readily expanded their range of loan products for energy projects. Instead, banks, simply have sought to better leverage existing products and customer segments to achieve an expanded set of outcomes beyond profitability, return on equity, and risk mitigation (examples include meeting sustainability, carbon dioxide reduction, or energy efficiency targets). Commercial banks' main connection to the energy efficiency field remains through their financing of energy service contracts undertaken by large energy service firms, such as Johnson Controls, Siemens, Honeywell, Ameresco, and others. These energy services companies are often referred to as ESCos, for short. These contracts specify the energy savings that will be realized by the customer over a defined period of time.

In nearly every case, the participants in these contracts are units of government (federal, state, or local) or investment grade credits in the MUSH (municipal, university, schools, and hospitals) market. Investment grade credits are highly credit worthy organizations that have had their bonds or loans rated by one of the large credit rating firms, such as Moody's, Fitch, or S&P, and have been deemed to be a lower risk.

Banks have expanded ESCo financing into the private sector (again, limited to investment grade credits), but the private sector participation is tiny compared to the government and MUSH markets. In near every instance, the ESCos provide the building owner with a "performance guarantee" that requires the ESCo to pay the owner if the energy reduction targets are not met. The commercial banks, however, expect the borrowers to meet their loan obligations, whether or not the reductions are realized (often called a "hell or high water" payment obligation). Performance guarantees, largely, are offered to the borrower to ensure the improvements prove cost effective, but are not collateralizing the loans, nor, necessarily, of particular concern to the commercial banks involved, although banks are growing more concerned about whether the energy targets will be met.

Among investment grade, private sector borrowers, financing is limited to owner-occupied or single-tenanted properties. Due to the falling values for commercial real estate properties, financing of performance contracts for multi-tenanted buildings is largely avoided by the commercial banking sector; banks do not feel they have adequate security for their loans should the borrower stop paying on their obligations, especially since most of these properties are owned by trusts with limited assets outside of the particular property in question. Within the ESCo financing space, Bank of America and Capital One are mentioned as particularly active; insurance companies also appear to be a growing source of funding.

A variant on the ESCo structure is the Energy Services Agreement (ESA), created by firms such as Metris Energy (also called the "negawatt" program). In this case, the energy savings are

more directly tied to loan repayment, unlike a typical ESCo project structure, creating both performance and credit risks for the lender. One advantage is that by owning the equipment, Metrus can access any tax benefits from the structure and can potentially get around new accounting rules limiting the ability of companies to use off-balance sheet financing for energy service contracts. In addition, the host has less risk since payments are only required to the extent that savings are generated (this structure does not carry a "hell or high water" provision).

A precursor to the ESA is the Power Purchase Agreement (PPA), which is used to finance renewable energy systems. Like both the ESCo and ESA structures, PPA financing is limited to investment grade credits, but, interestingly, PPAs are typically funded by banks from Asia and Europe, such as East West Bank, Rabobank, and WestLB AG, rather than by U.S.-based commercial banks, which are more active in the ESCo and ESA markets. Like the ESCo market, insurance companies are also a growing source of financing given the long-term structures, which are a good match for their annuity obligations. Annuities pay a fixed, monthly sum for an extended period of time and therefore match well to the fixed payments from these renewable projects.

In addition to these energy-focused lending programs, many commercial banks have created financing programs targeting the green building sector, primarily involving new construction within the commercial and industrial markets. Unlike the ESCo, ESA, and PPA markets, lending is not exclusive to investment grade credits, nor to single-tenanted space, but can range across the commercial and industrial sector. For the smaller buildings and non-investment grade borrowers, banks rely on conventional lending programs targeting middle market and small business sectors, such as Small Business Administration (SBA) programs and asset-backed lending.

Not surprisingly, one of the largest energy service companies, Johnson Controls, Inc. (JCI) has begun to examine how to use the Small Business Administration 7A loan program as a mechanism for financing performance contracts. The 7A program offers a 75% government guarantee on the loans, greatly lessening the risks to the commercial bank. Moreover, the guaranteed portion (75% of the loan amount) can be readily sold on the secondary market. Because banks don't have to find deposits that match the structure (fixed/floating-rate) or term of the loans, banks are more willing to lend for longer terms (>7 years) and at a fixed-rate; both are features that are atypical for most other types of commercial loans. The result is a loan structure well suited for energy efficiency and alternative energy projects—longer term, fixed-rate debt.

There is growing interest in the SBA program for several reasons:

1. SBA has raised the limits on the amount eligible for a guarantee
2. SBA expanded the definition of small business so that more firms now qualify
3. The number of firms with an investment grade rating is small compared to the number lacking one

Within the green building lending space, Wells Fargo, PNC, Bank of America, and, more recently, Comerica are often referenced as industry leaders. Representing a major change in mentality within the banking sector, green buildings are considered a better risk than conventional buildings and internal appraisers now routinely add 3–8% to their valuations due to lower operating costs, higher rents, and increased value upon sale. The Mortgage Backed Security (MBS) marketplace also has become active in the energy efficiency and green building sector as more and more institutional property managers build to LEED standards and seek to

achieve the ENERGY STAR performance levels. In most cases, enhanced design capabilities, construction practices, and building codes mean developers can develop high performing buildings at limited cost premiums over conventional properties, limiting the complexities in financing these projects.

A problem for small, community-level commercial projects is that historically, the primary lenders to these structures were small, community banks. Community banks, however, are under considerable duress as capital levels have fallen and regulatory scrutiny has increased markedly. As a consequence, there is far less capital available for construction or rehab projects for the small office and retail markets.

To reach the smallest commercial facilities and small, privately owned multi-family buildings, the commercial banking sector provides financing to intermediaries, particularly community development financial institutions (CDFIs—see below). Indeed, CDFIs have been quite adept at developing mechanisms to engage commercial banks through aggregating and selling loan pools or in securing direct loans, using their own balance sheets as security for these investments. Probably the most successful of the CDFIs in this regard is Community Preservation Corp. (CPC) in New York, which has launched a $1 billion energy retrofit effort targeting multi-family buildings, its staple customer base. CPC alone secured more than $150 million from private lenders, principally Deutsche Bank. But other types of intermediaries, such as leasing companies, also have been able to secure financing from commercial banks by leveraging their assets.

Commercial banks have less interest in directly targeting the financing opportunities in the small-scale commercial energy efficiency sector for many reasons. The primary issue is the small size of the loans. In reality, most energy efficiency loans are less than $5 million, and, more typically, well under $1 million. Within multi-family units, for instance, energy efficiency costs are typically $3,000 to $5,000 per unit. With most multi-family buildings having less than 100 units, the total cost of these projects is well under $500,000. In addition, the risks are considered excessive, especially today, following the steep decline in real estate values. Finally, with limited demand for these services, the costs of underwriting and servicing these loans may far outweigh the potential income to be earned. Commercial banks are looking for asset generation in the hundreds of millions annually, yet the demand for these specialized programs is well under that threshold—the largest programs are often originating only $25–30 million annually.

On the residential side, commercial banks have been even less active than on the commercial front. For the most part, efforts in the residential arena have involved construction financing for tract builders and providing consumer mortgages for the purchase of ENERGY STAR-rated homes. Banks have been far less engaged in the Home Performance retrofit market (although some have participated in the New York State Energy and Research Development Authority second mortgage program on a limited basis).

One mechanism of particular interest to commercial banks is the Property Assessed Clean Energy (PACE) platform, which uses real tax liens to access commercial debt markets (PACE is discussed in more detail below). Commercial markets are familiar with the property tax lien structure due to its use in generating funds for large water/sewer projects and consider these bonds to be lower risk. As a result, commercial banks have sought to facilitate growth in this vehicle. Citi and RBS, in particular, have shown great interest in tapping into this innovative product. While, as discussed later, growth in residential PACE is on hold, commercial PACE is still actively being pursued in a few areas.

Less prominent, but still important, have been the efforts of the commercial banks' Community Development Corporations (CDC). Typically, these CDCs focus on financing efforts related to Community Reinvestment Act (CRA) activities that are focused on low-income households and areas. A good example is an unsecured loan product offered by Charter One Bank to its low-income customers in Illinois for residential weatherization uses. More customary are loans and equity investments for affordable housing development and to CDFIs. A good example is Bank of America's recent announcement that it will offer $55 million ($50 million in low-cost, long-term loans and $5 million in grants) to CDFIs engaging in energy efficiency financing (http://ahead.bankofamerica.com/fueling-the-economy/bank-of-america-announces-new-energy-efficiency-finance-program/).

Probably the single largest activity of bank CDCs relates to financing affordable housing projects. Following the launch of Enterprise Community Partner's Green Communities program, a growing portion of these government assisted low-income housing developments incorporate energy efficiency measures. One issue for this market is that while these housing developers can access credit from commercial banks for construction and permanent financing at the outset, few banks are open to financing ESCo projects prior to the buildings' recapitalization, typically after the 15-year vesting period of the low-income housing tax credits. The result is that these buildings have limited ability to upgrade in the interim years in order to replace outdated and inefficient equipment or make other cost effective repairs.

Bank-owned CDCs also are extremely active in other types of tax credit activities, from New Markets Tax Credits (a program that provides federal tax credits to help incentivize investments in commercial projects in low income communities) to Historic Tax credits to Investment Tax Credits. Increasingly, even the New Market and Historic Tax Credits activities are focused on green and highly efficient buildings. Thus, nearly 100% of tax credit activities undertaken by commercial banks help to finance energy efficiency or alternative energy projects. Interestingly, the amount of tax credit equity purchased in the last few years vastly exceeds the $5 billion committed to the Clinton Climate Initiative for energy retrofits, but the tax credit activity receives less attention.

Credit Unions

Unlike the commercial banking sector, credit unions have shown increasing interest in participating in residential energy finance programs. Credit unions are typically much smaller than a commercial bank, with average assets under $100 million, while an average bank has assets exceeding $1.5 billion (see http://www.cuna.org/download/combanks_cus.pdf). Moreover, because credit unions are owned by the depositors, credit unions often are quite open to creating partnerships and programs that will benefit their customers/owners. Thus, it is not surprising that credit unions are among the few insured depositories responding to opportunities presented by Better Buildings programs in Michigan (through the Michigan Saves program) and in Milwaukee.

Mark Zimring, a researcher at Lawrence Berkeley National Laboratory, offers a good analysis of a loan program in Austin, Texas, involving Velocity Credit Union. In his report, Zimring examines why Velocity was interested in working with the local utility on a home performance with ENERGY STAR program as a lower cost means of obtaining new customers (see http://eetd.lbl.gov/ea/emp/reports/ee-policybrief_032211.pdf). Interestingly, Zimring found that the credit union has higher approval rates for participants in this program than its overall portfolio; better success in selling these customers on additional products; and great branding opportunities. But Velocity is hardly unique among credit unions. Credit unions are long-

standing partners in utility-sponsored residential retrofit programs. Perhaps the most established is the partnership between Efficiency Vermont and Opportunities Credit Union.

Within the utility industry, coops have been particularly focused on developing partnerships with credit unions, likely because these utilities serve rural areas, which have been underserved by banks and have a strong reliance on credit unions. A more urban example comes from ShoreBank Neighborhood Institute, which utilized two credit unions in Chicago for its loan program targeting homeowners with incomes of less than 80% Area Median Income (AMI). In this case, the credit unions' loans were supported by capital from a foundation and a dedicated loan loss provided by the local electric utility, ComEd.

Due to credit unions' small size, they are not active in the ESCo financing realm and, for the most part, are not large players in the commercial and industrial markets overall. Typically, credit unions focus solely on residential loan programs.

Community Development Financial Institutions (CDFIs)

CDFIs represent another fast-growing segment in the energy finance industry. CDFIs encompass a number of different institution types, including commercial banks, credit unions, nonprofit loan funds, and venture capital pools. CDFIs gain their particular distinction through certification by the CDFI Fund, a division of the Department of Treasury (see http://cdfifund.gov/what_we_do/programs_id.asp?programID=9 for a list of certified CDFIs). With total assets in the CDFI industry exceeding $7 billion, according to the Opportunity Finance Network, an association for CDFI institutions, CDFIs have proven successful in tapping commercial markets (see http://www.opportunityfinance.net/store/downloads/insideTheMembership.pdf).

Unlike CDFI banks, which provide financing for a range of uses, from residential to commercial, CDFI loan funds typically focus on one particular segment, such as single-family housing, nonprofit facilities, or multi-family residential buildings.

Few CDFI banks have been active in the energy finance space. The most notable exception is ShoreBank Pacific (now OnePacific Coast Bank as a result of its acquisition by OneCalifornia Bank). In contrast, nonprofit loan funds have shown a keen interest in the energy finance field. Indeed, many nonprofit loans funds, such as IFF (originally called the Illinois Facilities Fund) and Nonprofit Finance Fund, were capitalized in the 1980s for the explicit purpose of financing energy retrofits in nonprofit facilities. Others, such as the Community Investment Corp and Neighborhood Housing Services of Chicago, were early participants in community-based energy efficiency programs instituted when energy prices spiked during that period. These programs relied on capital from the local natural gas utility, which was a novelty in the 1980s, but has since grown in appeal. For instance, The Reinvestment Fund (TRF), based in Philadelphia, was made manager of almost $32 million in capital from a utility (PECO) settlement. An important point about this transaction was the fact that the settlement funds were provided to TRF as core capital, although restricted to funding energy activities. By granting as core capital, the structure has yielded significant benefits for TRF. With more capital, and therefore lower leverage, and the ability to capture the interest income from the underlying loans, TRF is better able to tap commercial bank debt for its energy and other activities. This is also unique in that of the 13 states with such settlement funds, this is the only one managed by a CDFI: the others were either placed into charitable trusts, state-managed funds, or independent nonprofits (see http://www.cleanenergystates.org/Funds/).

The Reinvestment Fund, like many other CDFI loan funds, also received ARRA funds via the State Energy Program and Energy Efficiency Conservation Block Grant (EECBG) funding. Many more CDFIs are accessing capital through the Department of Energy's Better Buildings program. The uses vary widely from residential (e.g., Enterprise Cascadia and Indianapolis Neighborhood Housing Partnership) to multifamily (e.g., Community Investment Corp and Enterprise Community Partners) to commercial (e.g., Pathway Lending and Enterprise Detroit) to industrial (Reinvestment Fund).

An important aspect of program design in CDFI-led efforts relates to the mechanism for funding their loans. Because these loan funds are not insured depositories (meaning they do not collect federally insured, low cost deposits to deploy in loans), these non-bank institutions must find the funding needed for their loans. CDFIs use a variety of mechanisms to secure this funding and turn to a multitude of sources for the capital. In most cases, their equity comes from commercial banks, foundations, and government sources, such as the CDFI Fund, a division of the Department of Treasury. The CDFIs then use this core capital to obtain debt from other sources. One common mechanism is to sell a pool of loans to a consortium of commercial banks, which join together to limit their individual risks. CPC, IFF, CIC, and INHP (a few of the CDFIs referenced above) use this mechanism. In other cases, the CDFIs borrow the funds from banks and philanthropic partners to secure the capital. In many cases, the CDFIs have to pledge assets or provide guarantees to secure the funds. Such is the case with Enterprise Cascadia for loans made under the Clean Energy Works Oregon program.

One interesting facet of the Better Buildings program is its requirement that the funding be used as a dedicated loan loss reserve, which then is used to obtain a pool of capital. This program requirement matches reasonably well with the pool model, but does not mesh with models leveraging the capital base of the CDFI. In the latter cases, the CDFI may have to pledge additional capital in order to obtain the leverage levels required by the program. Moreover, by requiring the capital be placed into a reserve and not loaned directly to borrowers, the CDFIs must borrow 100% of the funding, rather than just the incremental amount needed above the grant funding, driving up the end cost of the loans made to their borrowers.

Another interesting facet of the experience of CDFIs in the energy finance space is the difference in risks assigned to core activities versus those targeting energy efficiency. One example comes from the Indianapolis Eco-house program, supported by ARRA funds. The local CDFI, Indianapolis Neighborhood Housing Partnership, began an unsecured program targeting a similar clientele as its more established, conventional, secured loan program. While clearly an unsecured product carries more risk, the secured product had a longer term (10 years as compared to 4 years on the unsecured loan) land larger loan limit ($15,000 as compared to only $4,000 for the unsecured program). While not surprising that the leverage obtainable was far higher for the secured product—9 times INHP capital in the loan pool as opposed to only 2 times a dedicated cash reserve for the unsecured program, the level of difference is significant (9:1 vs. 2:1). The difference is indicative of the reluctance of commercial banks to move quickly into new products and the risk assigned to unconventional structures. It also is indicative of the realities of obtaining leverage for loan programs targeting hard-to-reach populations, such as lower income households, and using loan structures thought to be necessary for energy lending (unsecured, fixed-rate, debt), which are considered riskier than other lending terms.

As the energy finance marketplace matures, CDFIs represent an important avenue for growth and sophistication given their experience and expertise in developing secondary markets and proven ability to tap into commercial markets. CDFIs also bring a large number of existing borrower relationships that can greatly reduce transaction costs typical of energy loan

programs, where finding eligible, willing borrowers can cost far more than the interest income from the loan will bring. One of the most important and lasting outcomes from United States Department of Energy's ARRA programs will be the cementing of better connections to CDFIs, making better use of their market knowledge and creativity, and utilizing them as a distribution channel for reaching higher risk market segments.

Utilities

While on-bill financing has gained significant attention recently, utilities have offered financing programs for some time (principally, investor-owned utilities in California and municipal-owned utilities and coops nationally, which often serve harder-to-reach customers). One significant change in the industry seen recently has been the growth in interest in on-bill financing by state legislatures, which in turn, have been passing new statutory requirements that utilities offer these programs to their customers. Such is the case in Illinois, where new legislation requires each utility to offer up to $2.5 million in financing for residential and small commercial projects. While the funding will come from private sources, the utilities (ratepayers) will guarantee repayment of the loans. Just this year, both the Hawaii and New York legislatures passed legislation authorizing on-bill programs.

Within on-bill structures, key variants include whether the utility or a private party will be at-risk should payments not be made as agreed by the borrowers; whether the repayment is attached to the meter, and therefore extends beyond the borrower; and whether the capital for the projects comes from the utility or a private party (a good synopsis of utility programs can be gleaned from a forthcoming ACEEE report, *What Have We Learned from Energy Efficiency Financing Programs*; ACEEE is also researching a follow-up report that will focus on just on-bill financing). In Illinois, the utilities are at-risk for non-payment; repayment is not attached to the meter; and funding will come from a private source. In other cases, such as with Clean Energy Works Oregon, utilities merely service and collect loans made by a third party and assume no credit risk.

Another interesting program targets multi-family buildings in New Jersey (see http://www.nrel.gov/applying_technologies/state_local_activities/pdfs/tap_webinar_20110323_kreycik.pdf). This PSE&G program offers 0%, unsecured financing to affordable multi-family housing properties. The utility relies on the New Jersey state housing agency to underwrite and screen the borrowers in order to minimize losses. The program is particularly noteworthy because of the difficulty finding capital for these types of properties. Due to the excessive leverage and low operating margins among affordable housing projects, it is nearly impossible for these buildings to obtain commercial debt for these retrofits. Enterprise Community Partners and Clinton Climate Initiative found banks unwilling to lend to very strong operators, even with 50% cash collateral. Interestingly, even commercial banks that are extremely active in providing construction and permanent mortgages on these same properties and that maintain active large ESCo financing units could not be induced to fund the loans.

On the commercial side, Alliant Energy's shared savings program is among the industry's most established on-bill program. This program offers 5-year financing for the costs of projects with a minimum size of $15,000 (see http://www.alliantenergy.com/UtilityServices/ForYourBusiness/ProductsServices/BusinessRewardsIncentives/MinnesotaBusinessIncentivePrograms/015444). Under the terms of the program, the participant pays one-half of the expected savings to the utility for the term of the loan and then "owns" the savings after that. Because the program relies upon ratepayer funds, the program must obtain commission approval for continuation.

Probably the largest and most established program is administered by the Sacramento Municipal Utility District (SMUD), which began in 1977 and has originated more than 135,000 loans, with more than $450 million issued just since 1990 (see http://www1.eere.energy.gov/wip/solutioncenter/financialproducts/smudcasestudy.html).

Another large program is Manitoba Hydro's Power Smart Residential loan program, which originates more than $100 million per year (see http://www.airwaterland.ca/article.asp?id=4973).

A less common but growing method of using ratepayer funding for lending initiatives involves granting the funds to lenders. Probably the largest such program is TRF's energy loan fund referenced above, but another is the Technology Investment Fund seeded by Focus on Energy funding in Wisconsin. The funds are managed by an independent nonprofit organization, CleanTech Partners, which offers flexible financing for projects that offer significant energy reductions and utilize promising new technologies.

A key question for expansion of these types of programs is how loan programs are evaluated for cost effectiveness (such as the TRC test), since unlike a rebate or interest rate buy-down, the capital is returned and can be recycled. With utility incentives projected to grow to upwards of $12 billion annually, according to one study by Lawrence Berkeley National Laboratory, these incentives will play an increasingly important role in the energy finance industry (see Barbose, G., C. Goldman, and J. Schlegel, "The Shifting Landscape of Ratepayer-Funded Energy Efficiency in the U.S." *The Electricity Journal*, LBNL-2258E. October. http://eande.lbl.gov/EA/EMP/reports/lbnl-2258e.pdf). This funding could be especially important as utilities begin experimenting with using ratepayer funds to collateralize loan pools rather than merely buy down the interest rate. Massachusetts is one state exploring this opportunity.

Utilities also have been active in the Power Purchase Agreement and alternative energy leasing business as a large aggregator and purchaser of the tax credits available from these transactions. Indeed, their importance in the tax credit market has become even more profound following the recent financial crisis that reduced commercial banks' involvement in tax credit equity markets.

Federal Government

While ARRA greatly expanded the government's role in energy finance and created new avenues of support, such as through EECBG funding and HUD's new Power Saver program, a more lasting impact may relate to the broadening of agencies and structures supporting energy finance beyond EPA, HUD, and DOE. Examples include the Community Development Financial Institutions Fund (an agency supporting CDFIs within the Treasury Department) adding environmental impact measurement to its evaluation of proposals seeking allocations of New Markets Tax Credits. A more established effort comes from the support of green affordable housing by the Federal Home Loan Banks, which historically have been critically important sources of subordinated loans for these highly leveraged projects. The Federal Reserve Bank of Atlanta's efforts in New Orleans to connect its small dollar loan program targeting the underbanked with energy efficiency outcomes represents another novel innovation.

Equally important are the cross-sector approaches that seek to break apart funding silos to allow more efficient use of subsidies to attack problems holistically. A good example is the Green and Healthy Homes Initiative, a public-private initiative that seeks to create better housing by targeting lead hazards, energy efficiency, and better indoor air quality (see

http://www.greenandhealthyhomes.org/). Similarly, Mercy Housing Services is using Neighborhood Stabilization Program (NSP) funding in Chicago to ensure these reclaimed foreclosed homes not only have new owners, but homes more affordable and safer for the residents. Mercy has a list of pre-requisites, including ENERGY STAR-qualified HVAC systems, lighting, and appliances for any reclaimed properties using NSP dollars.

One interesting facet of ARRA and other stimulus programs, such as the Small Business Jobs Act, are the new tools provided to state and local energy finance efforts. A good example is the Qualified Energy Conservation Bond (QECB), which allows state, county, and local governments to issue bonds for energy-related activities with a portion of the interest covered by the federal government. The variety and sophistication of uses is just beginning (for instance, to support low-income loan programs and commercial PACE activities), but it is likely that QECBs will ultimately prove to be a particularly important source of capital for innovative finance programs. A potentially important source of capital in the Small Business Jobs Act is a provision authorizing the Department of Treasury to issue up to $1 billion in bonds annually for three years to support CDFIs (see http://cdfifund.gov/news_events/CDFI-2011-13-CDFI-Fund-Seeks-Public-Comment-on-CDFI-Bond-Guarantee-Program.asp).

State Governments

As a result of ARRA and RGGI funding, the number of state revolving loan funds and total capital under management have ballooned. According to a report by Lawrence Berkeley National Laboratory, states have allocated $650 million in State Energy Program funds for creation of revolving loan funds (see http://eetd.lbl.gov/EA/EMP/reports/lbnl-4322e.pdf). In some cases, these funds are managed by existing financial institutions, but in many cases, such as in Missouri and Wisconsin, the funds are being managed by governmental agencies themselves. Another big source of seed capital is through RGGI. New Jersey, New Hampshire, New York, Rhode Island, and Vermont are among the states intending to use a portion of the initial allowance funding to create new financial intermediaries (see http://www.rggi.org/docs/Investment_of_RGGI_Allowance_Proceeds.pdf). While no definitive study exists, it is likely that between EECBG, SEP, RGGI, and other program funds, state and local governments have expanded the capital base under their management by $1 billion in the last few years.

State housing agencies are among the biggest supporters of energy projects within state government. Increasingly, many are linking low-income housing tax credit allowances to energy efficiency projects, in many cases providing bonus points in the application phase for projects agreeing to follow Enterprise Community Partner's Green Communities guidelines. Indeed, state housing agencies are likely the largest source of capital within state governments for energy improvements, given the amount of capital provided on an annual basis for construction and maintenance of affordable housing. These housing agencies also provide capital for other types of projects. In Alaska, for example, the Alaska Housing Finance Corporation offers a variety of loan programs targeting single-family and multi-family residences, and even homeowner associations.

In some cases, state treasurer's offices have targeted involvement in the energy finance arena. Several have begun to purchase loans made by intermediaries. Nebraska's State Energy Office has run a very successful program for residential and commercial loans for many years (purchasing 50% of the former and 75% of the latter), while Pennsylvania, through its Keystone Help program, was the first to purchase 100% of the residential loans issued by an intermediary, AFC First. The Pennsylvania program is an offshoot of a more common approach of providing

"linked deposits" for loans, whereby the state or municipality simply places a deposit with the issuing bank at a below market rate to help reduce the end-cost to the borrower. Illinois offers such a program for green buildings, while Kansas used part of its SEP funding to capitalize a pool of deposits for banks issuing loans for energy efficiency retrofits. NYSERDA is considering an interesting twist, using Qualified Energy Conservation Bond (QECB) proceeds to purchase a pool of loans initially capitalized with RGGI funds (see http://eetd.lbl.gov/ea/ems/reports/ee-policybrief_012411final.pdf).

One key distinction among these programs is the risk that the state is willing to accept. In most cases, such as in Kansas and Illinois, the treasurers' offices are unwilling to accept any risk, requiring either full FDIC coverage or pledging of bonds as collateral support. In the Pennsylvania program, the purchases are collateralized by the loans, a 10% loss reserve, and a guarantee of AFC, but one that carries no additional collateral.

Within state revolving funds, these programs target a wide array of building types and rely on a variety of funding mechanisms. Early funds relied on Petroleum Violation Escrow Funds and brownfield remediation funding from the federal government. More recently, ARRA funding has become the largest capital source. Most of the state revolving funds target public properties, such as municipal buildings, schools, county hospitals, and state agencies, with the LoanSTAR program in Texas likely being the largest (see http://harcourtbrown.com/wp-content/uploads/State-Loan-Programs.pdf).

Another funding source beginning to look at energy projects are state development finance authorities. These entities have the ability to issue taxable and tax-exempt bonds and use the proceeds to finance commercial projects. The bonds carry the "moral" backing of the state, which means that the state, theoretically, will use general operating revenues to cover losses, but is not contractually obligated to do so. This presumed backing allows these agencies to borrow more cheaply than may be available for the projects themselves. In most instances, to protect the state, the finance authorities require the projects to procure back-up letters of credit from investment grade entities as credit support—typically, these letters of credit are provided by large commercial banks. These finance agencies have begun to tailor finance programs for the energy sector. For instance, the Illinois Finance Authority has been given statutory authority to issue up to $3 billion in "Additional Security" (moral obligation) loan guarantees or bonds for the development of clean coal, coal, renewable energy, and energy efficiency projects in the state.

County/Local Governments

On the local level, municipal governments, such as the City of Chicago, require various green elements to be included if public support is being sought. In Chicago, projects seeking Tax Increment Financing must include green features. In other cases, such as several counties in Maryland, property tax credits are provided for high performing buildings.

In terms of local governments, clearly the vehicle receiving the most attention is PACE financing. Begun as an experiment in Berkeley, California, the number of states and municipalities exploring this potion has exploded, with more than 27 states now having authorization to move forward with PACE programs (as of July, 2011).

PACE is a very innovative mechanism to promote energy efficiency investments in that it takes an existing financing mechanism that is well established and already well integrated into the bond marketplace, and simply targets the funding for a new purpose. Bonds supported by

property assessments are routinely used for water and sewer upgrades. These bonds are considered low risk by bond investors since municipalities can impose levies and sell the underlying properties, should the owners fail to pay their assessments. Instead of directing the funding for water and sewer upgrades, PACE funding is used to provide lower cost, long-term financing for energy efficiency and alternative energy investments.

When PACE was launched, many municipalities saw PACE as an attractive way to promote energy initiatives locally. However, the federal agencies responsible for overseeing housing finance stepped in due to the potential risks PACE financing presents to this marketplace. Their primary concern is that property assessments provide municipalities with a superior lien to mortgages issued by banks or governmental agencies, such as the Federal Housing Administration (FHA), and to loans purchased by Fannie Mae. Thus, by allowing additional liens to be placed on the homes ahead of these mortgages, should a default occur, the lenders could face large losses since they would be only repaid if there is any remaining equity after retirement of the property tax assessments. Thus, the very aspects that make bonds supported by property tax assessments appear as low risk to bond investors could make other housing loans riskier for lenders and the overall housing finance marketplace.

Due to these fears, the Federal Housing Finance Administration (FHFA) and banking regulators, such as the Federal Reserve, have declared that PACE poses a great risk to the economy and that these agencies will not allow banks and Fannie Mae to issue mortgages on the homes with outstanding PACE assessments. The result is that PACE's momentum has stalled. To overcome this challenge, PACE supporters have initiated lawsuits and crafted legislation to force the agencies to rescind their edicts (for a detailed overview of the current situation, see http://pacenow.org/blog).

Unlike residential PACE, commercial PACE programs are still being developed because commercial loans do not fall under the purview of FHFA and commercial PACE programs already required lender acknowledgement. For example, in Sonoma County, the program requires existing lenders to sign an acknowledgement that authorizes the property owner to obtain a PACE loan. A key question is what this acknowledgement actually means and whether it is legally required since many municipalities have the requisite authority to issue assessments routinely, irrespective of the specific use of the funds, and without seeking lender acknowledgement or approval.

While growing in importance, the PACE market remains relatively small. According to a recent national survey of the commercial PACE programs by the Renewable Funding, Clinton Climate Initiative and Lawrence Berkeley Laboratory, 71 projects have been approved totaling nearly $10 million (see http://eetd.lbl.gov/ea/ems/reports/pace-pb-032311.pdf). The report highlights several key elements of PACE programs:

1. Keeping Loan-to-Value ratios below 110%
2. Creating debt service reserve funds or leverage structures to cover any shortfalls in borrower payments
3. Finding financing for the construction and aggregation periods until a sufficiently sized pool exists for the bonds

The interesting structures being pursued include combining QECBs and PACE financing to deliver a lower blended interest rate; developing tranches of financing to ensure adequate coverage for bonds carrying state or local guarantees; or creating separate loss reserves to

protect against losses, such as in Vermont, where the state is exploring utilizing a portion of its RGGI funds to serve as a loan loss reserve.

A key challenge for growth among commercial PACE programs is the time and difficulty in getting acknowledgment from the existing lien holders. Finding an authorized signatory at the individual lending institutions, navigating the risk management bureaucracies at these institutions, and getting approval from secondary market players is a formidable challenge. Therefore, developing mechanisms to streamline this process will be critical. One potential idea would be to target projects that used the SBA 504 program because the primary lender would only have a loan-to-value ratio (LTV) of 50% and the U.S. government funding the subordinate lien. If the SBA could be persuaded to categorically allow PACE on these properties, it would open up a wide array of properties across the country to the credit mechanism.

A less discussed, but still important, financing source at the local level is Tax Increment Financing (TIF). TIFs allow specific districts to issue bonds to be repaid by a portion of the growth in value of the real estate tax based within the area. TIFs are often offered as subsidies to cover a portion of a rehabilitation project. In Chicago, a variant, the Small Business TIF (or SBIF) is used to promote energy efficiency retrofits on small commercial projects. In most current instances, the funds are given as grants, offering additional equity for the project, and thus leveraged at the project level, but could be issued as subordinate notes to be repaid and therefore recycled further.

Finance Companies

As utilities and governments have expanded financing offerings, a number of private finance companies have entered the energy finance space. Perhaps best known is AFC First Financial, the financing intermediary involved in Pennsylvania's Keystone Help program, and now administrator for a growing number of programs, such as Illinois' on-bill financing program. Other intermediaries are the administrators of utility-funded energy efficiency program, such as Wisconsin Energy Conservation Corp (WECC), which launched Energy Finance Solutions, a stand-alone financing arm owned by WECC that offers residential loans to utility-funded programs and participants. Similar models have been established by other program administrators, such as the Electricity and Gas Industries Association (EGIA), which offers residential loans in partnership with utilities in California, and Viewtech Financial Services, which appears to be the largest utility partner lender, claiming to have disbursed more than $500 million to 40,000 customers. Energy Finance Solutions, Viewtech, and most other residential lenders in this space have limited capital, so their business model involves originating the loans and then selling them to a secondary source. For AFC, this secondary source is the Pennsylvania Treasurer, as well as Fannie Mae; EFS and Viewtech are other Fannie Mae approved lenders. One issue for these entities is that since they are not insured depositories, their funding can be expensive, as it comes from the commercial markets rather than low cost deposits, raising costs for any loans issued through these firms.

A large category of finance company typically not included in reviews of the energy finance industry are community development corporations (CDCs) involved in administering the Small Business Administration's 504 program. Under this program, commercial banks provide loans covering 50% of the project costs, with CDC's offering up to 40% funded by a debenture issued by the federal government. New 504 program guidelines provide bonus credit for projects meeting LEED standards and encourage energy efficiency components within the 504-funded projects. The 504 program represents another untapped resource for energy finance given its

ability to offer long-term, below market fixed-rate debt through direct access to commercial debt markets. Of particular interest is a new $500 million program created by Morgan Stanley that works through a CDFI, The Community Reinvestment Fund (CRF), which likely is more amenable to pursuing energy efficiency outcomes due to its social mission. Indeed, CRF is testing a new SBA product to promote energy efficiency equipment.

Leasing companies represent another type of finance company involved in the energy finance space. Perhaps the best known are leasing firms focused on alternative energy projects, such as Solar City and CT Solar. Less familiar are companies such as CSI leasing and Light Leasing USA. CSI, which historically has focused exclusively on computer equipment, created a new unit focusing on alternative energy projects, such as methane gas recapture facilities connected to municipal landfills. Light Leasing USA specializes in financing LED lights and works closely with the local electric utility in Chicago, offering financing for a portion of the lighting upgrade not covered by the utility rebate.

Private Equity/Venture Capital/Venture Philanthropy

The clean tech arena has been a venture capital favorite for some time, but a more recent variant involves providing funding for alternative energy project developers (i.e., Solarcity, SoCore Energy, etc.) that use the funding to cover project costs given the dearth of debt for sponsors lacking an investment grade credit rating. Large venture firms include Starwood, NRG, Goldman Sachs, and Kleiner Perkins; smaller ones include DBL Investors and Next Street Capital.

An interesting variant to the conventional venture model is venture philanthropy. Venture philanthropy typically involves high net worth individuals making equity investments that offer exceptional social or environmental returns, as well as potentially lucrative financial upside. A good example is One PacificCoast Bank (formerly OneCalifornia Bank), which was founded and capitalized by Tom Steyer and his wife, Kat Taylor, with an initial $22.5 million investment. Steyer is perhaps better known for his leadership related to efforts to prevent Proposition 23 from being ratified in California in 2010. Other notable venture philanthropy investors include Pierre Omidyar, the founder of eBay, and Jeffery Skoll, its first president. Within the real estate world, another notable individual investor is Jonathan Rose of the Jonathan Rose Companies. High net worth individuals represent an untapped but potentially large source of capital for the energy finance field.

Philanthropy

Foundations, historically, have played an important role in capitalizing public purpose financing efforts, primarily through Program Related Investments (PRI). PRIs are typically below market, high risk loans made for program purposes that count towards the IRS disbursement requirements of tax exempt foundations. Among the biggest issuers of PRIs are The Ford Foundation, MacArthur Foundation, and FB Heron Foundation. All have provided funding for energy finance projects, primarily to CDFIs, which then used this funding to leverage bank debt to expand program offerings. More recently, Living Cities (a consortium of foundations focused on inner-city programs) and others have offered funding to energy programs around the country, including Clean Energy Works Oregon. Family foundations, established by high net worth individuals, offer a new avenue for high risk capital.

A variant of the PRI is mission investing, which seeks to have foundations invest their endowments in program-related activities. Since these investments require observance of fiduciary requirements, these investments typically focus on investment grade bond

opportunities, described below. But with private equity rising as a prominent asset class in most endowments, higher risk pursuits do seem permissible.

Institutional Money Managers

In the institutional sector, most of the attention in the energy finance space falls to the socially responsible investment (SRI) managers, such as Calvert and its foundation and the General Board of Pension and Health Benefits of the United Methodist Church. The latter is a very large player in the affordable housing space and increasingly interested in environmental impacts. Many SRI investments are FDIC-insured deposits placed at CDFI banks to further local lending, but also include equity investments in CDFIs and mission-driven companies, as well as purchase of asset-backed mortgages for energy-efficient housing. As mentioned, a good example of the latter comes from the partnership between CPC and the New York State and New York City employee pension funds for multi-family housing loans issued by CPC. The latter is a variant on "green fixed income" investing, which focuses on investment grade bonds that have an environmental benefit. Community Capital Management is a firm offering such a strategy, building upon its historical focus of purchasing investment grade bonds offering a social return, such as Fannie Mae guaranteed bonds used to construct low income housing units. Typical environmentally focused bonds could include FHA guaranteed loans used to construct green housing or municipal bonds for constructing more efficient water treatment facilities.

Outside of the SRI space, institutional managers are active in the Power Purchase Agreement marketplace. Typically, these are insurance companies, such as MetLife, John Hancock, and Prudential, whose need for long-term fixed rate assets matches the typical PPA structure. Another key source of capital for energy retrofits is the institutional property managers that have begun to target tenant improvement allowances offered as inducements for new occupants towards energy efficiency upgrades. In New York, a partnership between NRDC, Johnson Controls, and Jones Lang LaSalle is exploring how to use these funds to reduce greenhouse gas emissions.

THE NEXT FRONTIER

While the energy finance sector is expansive, several financing avenues appear well suited for energy initiatives. Many of these avenues relate to ongoing work to better integrate unbanked and underbanked households into the traditional financial services industry. According to the Federal Deposit Insurance Corporation and other experts on this field, such as Center for Financial Services Innovation, nearly 60 million people in the U.S. are unbanked and millions more are underbanked due to tougher credit standards on credit cards. In total, as many as 100 million people in the U.S. lack good financial services. It is very likely that many of these individuals face considerable utility bills and could greatly benefit from energy efficiency efforts. But, lacking a connection to the mainstream financial community, new avenues to serve them must be found. Among the areas for exploration: peer-to-peer lending platforms, such as Prosper.com to provide financing for appliances or HVAC upgrades in the residential sector; the Individual Taxpayer Identification Number (ITIN) loans for undocumented homeowners; using mobile phone applications to make loan servicing less costly and easier; and distributing loans through emerging channels, such as debt cards.

SUMMARY OF MARKET PLAYERS AND THEIR ROLES IN ENERGY EFFICIENCY FINANCE

	Overview	Risk Profile	Investment Goals	Data Needs	Opportunities	Institutions Referenced
Private Capital	Largest Segment (#s and $s) Diverse array of institutions	Risk averse Avoid credit risks Avoid performance risks Focus on proven technologies Work with trusted partners	(Above) market returns Large annual production Positive PR	Locating proven technologies Matching customers to opportunities Ability to predict returns accurately	Largest source of capital Touch large numbers of buildings Good at scaling programs	Bank of America Citi Capital One PNC Comerica AFC First
Mission-Based Lenders	CDFIs are largest segment Diverse array of types Most are <$100 MM in assets Limited profitability Very innovative	Risk tolerant Accept greater levels of credit risk Avoid performance risks Target under-served populations	Double/triple bottom line Accept lower returns	Locating proven technologies Ways to reduce performance risks M&V	Good at accessing private capital Able to leverage other subsidies Interest in energy efficiency Very innovative	Community Preserv. Corp Enterprise Cascadia The Reinvest-ment Fund CIC IFF One Pacific Coast Bank

	Overview	Risk Profile	Investment Goals	Data Needs	Opportunities	Institutions Referenced
Utilities/ Rate-payers	Growing interest in finance Lending programs are small Low leverage in loan programs	Risk Tolerant Accept greater levels of credit risks Accept performance risks Significant regulatory oversight	Accept below market returns Regulatory risk a big concern Positive PR	Mechanisms to drive participation M&V	Large source of risk capital Interest in leverage Understanding of efficiency Accept performance risks	SMUD Manitoba Hydro Alliant Energy PSE&G
Federal Gov't	Largest source of risk capital Diverse array of subsidies Growing number of programs	Risk tolerant	Leveraging private capital Market stimulation Job creation/ retention Accept below market returns	Proving performance	Touch large number of properties Supports market development	
State/ Local Gov't	Diverse array of programs Interest in promoting efficiency	Risk tolerant	Protecting tax payer funds Modest returns Job creation/retention Accept below market returns	Delivery efficiencies Reducing transaction costs	Large potential source of capital Ability to access debt markets	
Socially Respon-sible Invest-ors	Diverse array of institutions Philanthropy is most recognized Pensions biggest capital source	Philanthropy is risk tolerant Other segments avoid credit risks May accept performance risks	. Leveraging private capital May accept reduced returns	Locating proven investments Reducing performance risks M&V	Source of risk capital Leveraging utility incentives Operating support for innovation	MacArthur Foundation Heron Foundation Calvert Investment Methodist Pension Fund