The iron triangle: Integrated energy efficiency funds link project finance to performance and spark large-scale investment

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Abstract

From the experience of a global energy efficiency (EE) best practices effort launched in 2007 has emerged a new concept in EE project development, one that tightly links innovative contracting frameworks and loan underwriting rules to create more bankable projects and accelerate the adoption of energy efficiency virtually anywhere in the world. The new paradigm uniquely combines responsibilities of owners, lenders, and contractors in ways that create interlocking obligations, a so-called iron triangle that insures a successful outcome for each stakeholder.

Large numbers of relatively small projects conforming to the new performance-based framework can be safely assembled to form a much larger edifice, a secure collateralized debt obligation (CDO), thereby creating commercial scale for EE project finance never before realized. At scale, EE CDOs make possible a new asset class for professionally managed investment portfolios and lead ultimately to investor appetite for energy efficiency returns. Just as ease of underwriting project loans creates greater building owner interest in EE investing (market push), greater investor appetite for EE returns increases demand for EE projects (market pull). Such a virtuous circle is the key to sparking a significant new round of sustained investment in energy efficiency.

The new model is strictly commercial, as nothing in it requires government funding. The model is both replicable and scalable globally, as it requires neither special legislation nor a particular regulatory regime. The paper will describe how aspects of the framework were developed and provide details of selected case studies in London, Bangkok, and Chicago. It will also preview the structure and governance of a significant new fund being planned for Asia. The author helped launch and direct the EE best practices effort and currently serves as *pro bono* consultant to loan investors, guarantors, and financial intermediaries as well as to EE project principals participating in the program.

Introduction

A common problem arises when a promising commercial idea like energy efficiency reaches a stage known as the "Valley of Death" – that is, when the idea is not yet perceived as workable in practice or at scale and is therefore considered too risky by traditional investors, like building owners, mortgage lenders, or investment portfolio managers. Crossing the valley requires some kind of convincing demonstration of economic feasibility, which in turn requires financial resources, hence the dilemma. Under these circumstances, loan investors are deterred from providing capital, bank regulators are not supportive of the unknown risk, and investment portfolio managers have little access to energy efficiency returns. If nothing changes, energy efficiency will remain stuck in the Valley of Death for a long time to come. Note that we are talking about the difference between demonstration-scale and full-blown market acceptance. Thanks to regulatory initiatives, carbon pricing, and other policies, energy efficiency is happening to some extent almost everywhere. As markets go though, energy efficiency is underdeveloped and is having a small impact relative to its potential.

To borrow a concept from Silicon Valley, the nature of technical innovation in building energy efficiency results from the

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interplay of knowledge (research), technology (engineering), and delivery to market (enlightened entrepreneurship). In the case of energy efficiency, the first two (research, technology) appear to be both ample and vibrant. Energy efficiency suffers from a clear delivery gap however.

U.S. Department of Energy (DOE) Secretary Steven Chu once lamented publicly that the country might have more energy efficient homes were it not for the fact that people preferred granite counter tops (Wald, 2008). A 2006 survey by the U.S. DOE found that the commercial buildings sector is, relatively speaking, underserved by the energy services industry and also observed that total energy services industry investment in efficiency projects was no more than the authorized budgets of all ratepayer-funded electric and gas efficiency programs (Hopper, 2007).

A way for the energy efficiency market to develop its global potential is for EE project finance to advance in ways similar to home mortgage finance in the 20th century. Consider the situation faced by nineteenth-century homebuyers, whose sole access to loan capital covered a mere fifty percent of the property's value for a term of less than five years (Weiss, 1989, p. 110). In the past century, financing a home has changed in ways that dramatically accelerated *per-capita* home ownership, using the house as collateral but progressively liberalizing underwriting requirements to make it easier for applicants to qualify. A similar transformation is needed to make energy efficiency projects ubiquitous. Innovation in EE project finance has the potential to do for building efficiency in the coming century what 30-year mortgages, standardized loan contracts, and collateralised mortgage obligations did for home ownership in the last.

Building on the previous example, a three-step process is envisioned.

1. Make EE projects more bankable with new forms of credit enhancement, eliminating onerous down payment and collateral requirements.
2. Demonstrate profitable EE lending on a commercial scale, not dependent on government inducements.
3. Securitize EE debt, creating collateralized debt obligations (CDOs) and an appetite for EE returns among traditional investors.

Overview

In May 2007, former U.S. President Bill Clinton and Mayor of London Ken Livingstone announced an ambitious energy efficiency best practices effort. The Energy Efficiency Building Retrofit Program of the Clinton Climate Initiative (CCI) explored ways to make efficiency retrofit projects more bankable for CCI client cities in the C40 Climate Leadership Group founded by Livingstone by using unsubsidized, commercial models applicable in a variety of countries and considerably more scalable globally than current regulated and legislated models tied to local jurisdictions (WJCF, 2007).

The conclusions presented in this paper are the culmination of Clinton Foundation experience gained on more than a hundred projects in over 20 global capitals, working with leaders in finance (JPMorgan Chase, Deutsche Bank, Agence Française de Développement), energy services (Honeywell International, Siemens, Schneider Electric, Johnson Controls, Dalkia), international law (Holland & Knight, McDermott Will & Emery), real estate (Vornado Realty Trust, GE Real Estate, Wien & Malkin), and public agencies (London Transit, Chicago Public Buildings Commission, Hong Kong MTR). Certain of these projects are presented below as case studies.

STEP 1: MAKE ENERGY EFFICIENCY PROJECTS BANKABLE

A new approach to EE project finance is needed because, in the absence of a reasonably high and stable carbon price, energy efficiency is one of the main low-carbon investments that make financial sense to address the rapid growth in CO_2 emissions, especially in Asia where increased urbanisation is driving energy use in the built environment. Private sector decisions about the level of EE investment face an array of institutional barriers and market failures, especially poor access to EE project finance. The following are just a sample of the reasons why EE decision-making is not always optimal:

- Despite compelling economics, retrofit projects fail to attract financing as they are an unfamiliar asset class to most investors and suitable credit underwriting processes do not exist.
- The core issues of security and credit enhancement have not been adequately addressed – that is, guarantees against default are not sufficiently strong because a building's market value is typically pledged to first mortgage holders, leaving little for subordinated lenders to secure the loan.
- Nevertheless, commercial lenders would be willing to make EE loans, provided there is additional security or credit enhancement and EE projects funded produced credible cost savings at levels high enough to cover debt service (principal & interest).

Recent surveys of EE finance mechanisms, notably by the Energy Foundation (Kats, 2011) and Rockefeller Foundation (DB Climate Change Advisors, 2012), describe methods that rely to some extent on incentives, both positive and negative, developed by government policy makers. Yet, others have successfully demonstrated commercial approaches to EE project finance that require neither regulatory intervention nor enabling legislation, notably The Clinton Foundation (Bevington, 2012). The advantage of commercial lending models is that it is not necessary to manipulate the legal and regulatory environment for them to work, eliminating a significant barrier to global adoption. With commercial frameworks, the rights and obligations of principals work equally well in a number of sovereignties and banking regimes, without special inducements. Making EE loans profitable commercially is a key element of expanding EE project finance globally.

Several techniques have contributed to making EE more bankable in a given jurisdiction like the U.S., but three stand out for their global potential.

- Energy Performance Contracting (EPC) – An updated performance-based, design-build approach to contracting energy efficiency retrofit projects and the *sine qua non* of the EE project finance vision.
- Energy Performance Lending – For mortgaged properties with limited equity or refinancing options, a new form of

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collateral and underwriting process for energy efficiency projects.

- Managed Utilities – For multi-tenanted buildings, a special entity structure that removes a significant decision hurdle by aligning incentives between owners and leaseholders.

STEP 2: DEMONSTRATE ENERGY PERFORMANCE LENDING ON A COMMERCIAL SCALE

EE project finance on a commercial scale is a potentially profitable new business for the global financial services industry, one tailored to the needs of the built environment. To be attractive commercially, banks might consider several characteristics of a new loan product.

- Does it fully identify and adequately mitigate all risks posed by the new lending?
- Does it confer an advantage to the lender, not routine business currently underwritten by competitors?
- Does it represent a cross-selling opportunity with their existing clients and business credit lines – that is, a strategic fit?
- Does it enhance the value added by a bank's relationship managers in the real estate sector and do customers view it as a higher level of service?
- Does it leverage existing clients who are known to the bank, thereby avoiding customer acquisition costs such as marketing, onerous on-boarding requirements, and extra due diligence?

If the answer to these questions is 'yes', commercial lenders are more likely to invest capital and resources in a new product. If subsequent lending proves profitable, banks will likely expand their efforts, providing building owners with ever-greater access to EE loan capital. In this vision, banks take on manageable risk, not losses to be covered by inducements.

STEP 3: CREATE INVESTOR APPETITE FOR ENERGY EFFICIENCY RETURNS

This step is several years in the future, as commercial lending must first reach a critical minimum volume before investment banks will deem it worthwhile to manufacture securities backed by EE debt obligations. There are several pre-conditions that must be satisfied for a secondary market in collateralized EE debt to develop.

- EE debt must be rate-able by credit agencies so that investors can reliably determine the investment grade of resulting securities.
- For rate-ability, contracts must be standardized and conform to a common underwriting framework that meets investors' quality standards.
- Contract volume must be sufficient to meet investment minimums and to insure market liquidity – that is, a number of buyers and sellers that is adequate for smooth market operation.

To meet their fiduciary responsibilities to invest wisely on behalf of its clients, even when those conditions are met, portfolio managers might in some cases have to make changes in investment policy and practice, as some are constrained to invest only in approved asset classes. Accordingly, EE debt must be accepted as a new asset class by mainstream investors before demand for EE debt is likely to become widespread.

The impact of widespread investor appetite for EE debt would be enormous, effectively creating a positive feedback loop for EE project development.

1. Greater access to dedicated capital on favourable commercial terms makes investing in EE projects more attractive to building owners.
2. As scale builds, banks find EE lending a profitable new business and a good strategic fit with existing efforts, expanding the resources needed to originate a significant volume of loans.
3. Given a positive default history in a number of years, credit agencies begin to award investment-grade status to EE debt.
4. Investment banks respond by purchasing and packaging the debt for traditional investors, a profitable new business for them.
5. As a new EE asset class takes hold and more portfolios seek to match the returns of competing funds, investor demand for EE returns increases.
6. Given standard energy performance loan contracts and the global reach of securities markets, increasing investor demand becomes an additional incentive for banks to originate EE loans, no matter their location.
7. Global demand for EE returns leads to energy performance lending in many regions of the world simultaneously, driven by market forces.

Step 1. Making Energy Efficiency Projects Bankable

When President Clinton launched the Energy Efficiency Building Retrofit Program in 2007, the aim was to seek EE project development frameworks that were applicable in a variety of countries and more scalable globally than models tied to the regulations and practices of a single jurisdiction.

The program delivered *pro bono* advisory services to building owners for five years in over twenty large cities worldwide, negotiating technical and financial performance terms on more than a hundred projects. The experience suggests that contracting and lending, which are properly integrated, can resolve the most difficult delivery barriers to energy efficiency and potentially move the business to a high-volume, low-margin model while delivering attractive investment returns to all participants.

Table 1 lists six barriers to EE project delivery; and to suggest the kind of innovations required to address them, assigned a broad solution and a specific business process to each barrier.

The result was a list of contracting and lending innovations listed in Table 2, designed to address the original barriers that would make EE bankable.

As they were not subject to banking and tax laws unique to the U.S., innovations with the most potential globally were reduced to four.

- Integrated energy efficiency fund.

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Table 1. EE Delivery Barrier, Solution, and Proposed Processes.

Barrier	Solution	Process
Management time	Turnkey approach	Performance lending
Uncertain savings	Credible savings guarantee	Performance contracting
Inadequate security	Credit enhancement	New underwriting rules
Split incentives	Aligned incentives	Managed utilities
Capital budget competition	CapEx funding alternatives	Current obligation financing
Borrowing & credit limits	Off balance sheet accounting treatment	Tax-exempt equipment leasing

Table 2. EE Delivery Barrier and Relevant Innovations.

Barrier	Innovation
Management time	Integrated energy efficiency fund
Uncertain savings	Contractual savings indemnification
Inadequate security	Performance-based credit underwriting
Split incentives	Managed utilities special-purpose entity
Capital budget competition	Municipal leasing (US public owners)
Borrowing & credit limits	New finance agency role (US institutions)

- Energy performance contracting (energy savings warranty).
- Performance-based credit underwriting.
- Managed utilities special-purpose entity.

SOLUTION: INTEGRATED ENERGY EFFICIENCY FUND

The key idea behind the integrated energy efficiency fund (IEEF) is that building owners obtain engineering, contracting, and financing in one place to minimize the time and attention required by management to address energy efficiency. Only projects that pay back within the term of the loan are funded, and each project participant accepts only risks that they are qualified to manage – that is, owners accept business operating risk, banks accept credit risk, ESCOs accept engineering risk. Principals accept no unmanageable risks, such as energy price risk.

While building owners will take down the loans under repayment terms established by the providers of capital, they will normally work with local community lenders with whom they are more likely to have existing relationships and who it is expected will originate and service most loans. Such local lenders will be the fund's direct customers, as they will submit conforming loan applications to the fund for approval, effectively using it as an on-lending facility. The fund is expected to be profitable for the investors as is the originating and servicing of loans by local banks. Figure 1 schematically illustrates the flow of funds and obligations among the participants in the fund.

SOLUTION: ENERGY PERFORMANCE CONTRACTING

As guarantor of project performance, ESCOs provide an energy savings warranty to ensure that promised savings are achieved. It obligates the ESCO to pay cash damages for any savings shortfalls. The warranty is normally backed by a financially stable multi-national and can be supplemented, if needs be, by insurance or a bond, which indemnifies owners in the event an ESCO defaults on the savings warranty.

EPC is sometimes understood to include a financing structure where ESCOs arrange financing and sometimes take payment in the form of share energy savings, but that is not the case for purposes of this discussion where sub-national government agencies and private building owners are the targeted users. To determine if long-term energy savings estimates were being met, a U.S. DOE evaluation found that EE retrofit project performance often lags in three areas, which EPC is designed to address (Zenger, 1988).

- Vendor performance – Retrofitted buildings generally achieve some energy savings, but often less than was expected, due to either engineering oversights or contractor implementation errors.
- Energy performance – For a wide variety of reasons, even properly retrofitted buildings experience savings shortfalls for limited periods of time during the project performance period.
- Savings persistence – For an average retrofitted building, initial energy savings often degrade steadily after the first year.

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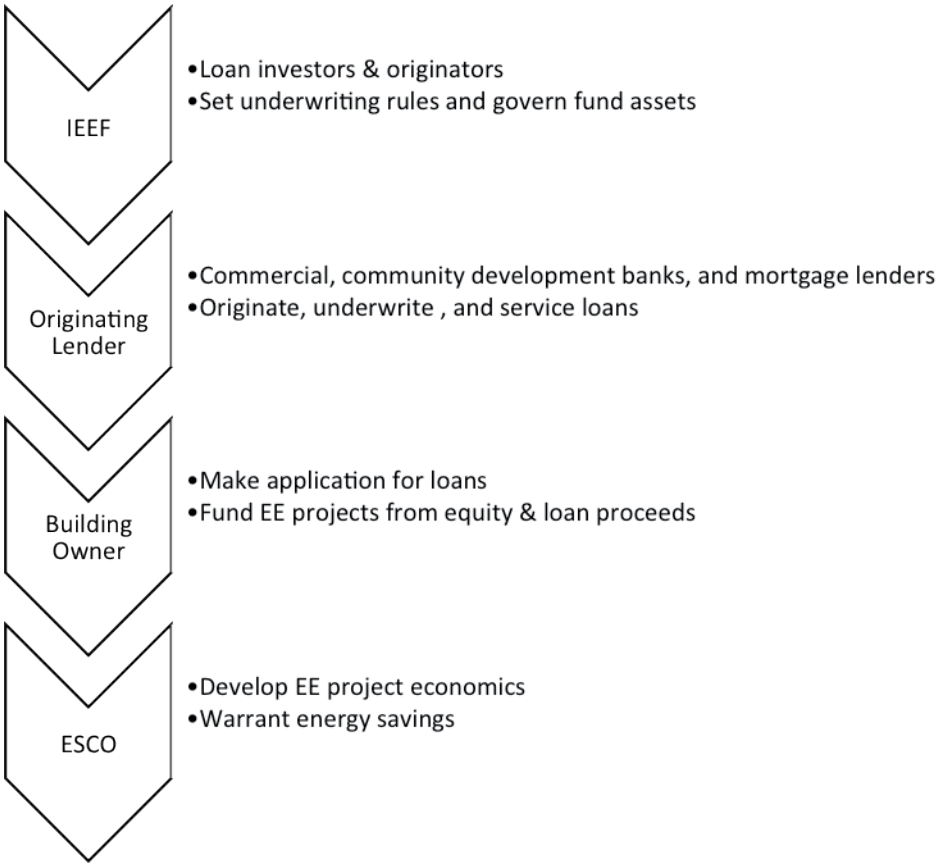

Figure 1. Integrated Energy Efficiency Fund.

Figure 2 schematically illustrates the obligations (dashed lines) and funds flows (solid lines) of energy performance contracting (EPC) as practiced in its updated form. Note that building owners have separate obligations to their utility, their lender, and their contractor. However, the obligations are effectively interlocking – that is, obligations to the bank are covered by firm contractor guarantees and are required by the loan underwriting process. EPC liquidated damages are fixed by contract at a level needed to cover potential savings shortfalls to meet cash flow projections. Like any other corporate warranty, the value of savings guarantees is a function of the contractor's credit rating.

SOLUTION: PERFORMANCE-BASED CREDIT UNDERWRITING

Clinton Foundation experience resulted in the additional insight that mortgage underwriting rules are somewhat outdated and that a new credit underwriting process is needed. Whereas mortgage lending is backed by a building's market value, EE projects create value in the way that an infrastructure project does – that is, by enabling cash flows used to repay the debt over time. For example, bridges are often financed using a project finance template that relies on tolls collected over many years to repay the loan. EE projects share elements of both project finance and mortgage finance and require a hybrid approach with elements of both. The new EE credit-underwriting model has the following key elements:

- Projects in which the quality of savings guarantees is raised to a point where they are credible to lenders.
- Indemnification of projects through insurance products in ways that cash liquidated damages cover any savings shortfall to insure repayment.
- A syndicate of capital providers and originators to spread credit risk in the initial demonstration phase and to improve the skills of bank personnel.
- A dedicated EE investment loan product with standardised, off-the-shelf underwriting requirements marketed to specific building sectors and addressing the specific needs of each.

SOLUTION: MANAGED UTILITIES SPECIAL-PURPOSE ENTITY

The idea behind a managed utilities service contract is that the capital expense of an EE project is assumed by a special-purpose entity (SPE), which passes through its cost to tenants under the terms of existing leases as a so-called utility service, schematically illustrated in Figure 3. Tenant utility expense is capped at current levels by the savings guarantee; and energy savings, which are also pass through to tenants, covers the added cost of repaying capital expense. As savings exactly offset project costs during the performance period, a tenant's net outlay remains level throughout the performance period and is permanently reduced at the end of it. The innovation addresses common area energy use rather than a tenant's own use. While an ESCO can, practically speaking, set up such an entity for its projects, recent changes in accounting standards mean that such an arrangement would jeopardize the off-balance-sheet treatment normally afforded owners when an independent

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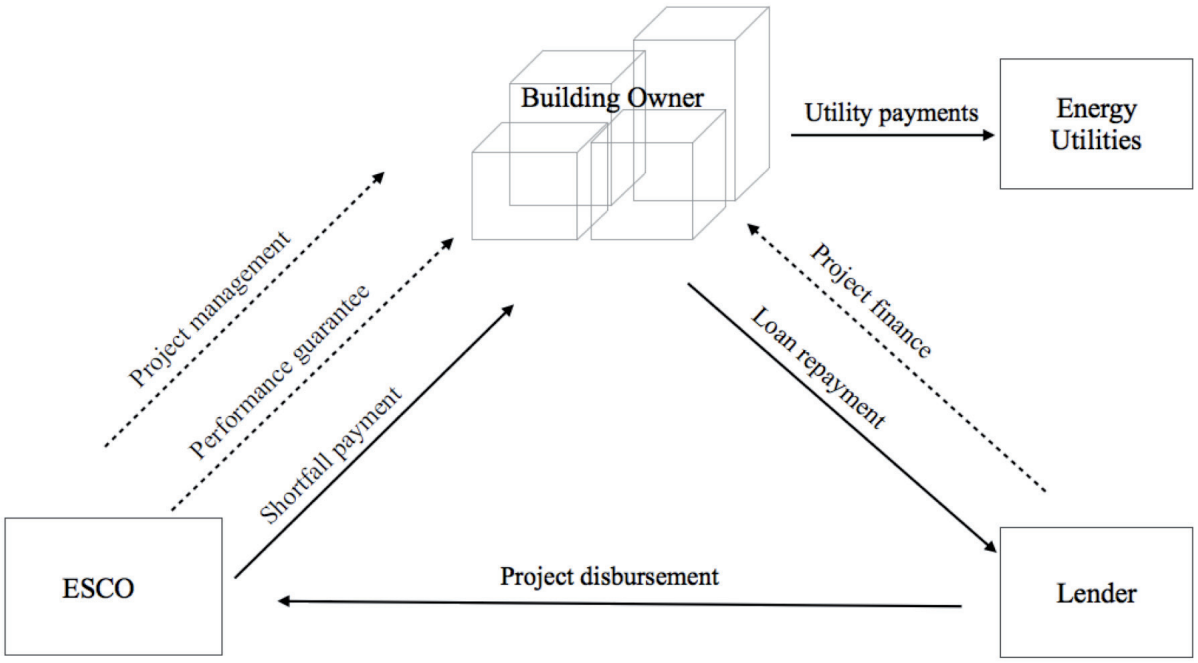

Figure 2. Interlocking obligations of energy performance contracting.

3rd party takes title to the project. Unfortunately, accounting abuses (WorldCom, Enron) have resulted in more restrictions on the use of SPEs in recent years.

CASE STUDY: GREATER LONDON AUTHORITY RE:FIT PROGRAMME

Originally known as the London Building Energy Efficiency Programme (BEEP), RE:FIT provides a procurement and contracting framework for public-sector organisation use to improve the energy efficiency of their buildings. It was announced by Mayor Ken Livingstone during the same May 2007 press conference that former U.S. President Clinton used to launch the CCI Energy Efficiency Building Retrofit Program on behalf of the C40 Cities. At the time of the announcement, some of the largest global ESCOs had already agreed with CCI to a set of uniform EPC contract terms and conditions, including Siemens, Honeywell, Johnson Controls, and Schneider Electric. Later Dalkia (a/k/a Veolia Environmental, an arm of Electricité de France) would join the list.

In October 2007, the GLA issued a tender conforming to EU procurement rules and incorporating all significant elements of the CCI EPC best practices. The first contract was awarded in January 2008 and involved the headquarters of Transport for London (Windsor House), which eventually became a £4 million project, saving £770 thousand annually, reducing electricity use by 25 %, gas use by 20 %, and CO_2e emissions by 3,650 tonnes *per annum* (euESCO, 2011).

The London program initially attracted three public sector organizations including Transport for London, the Metropolitan Police Service, and the London Fire & Emergency Planning Authority. The first tranche included a pipeline of 42 buildings. By the end of 2012, the programme had attracted 64 public sector organisations, including 24 of London's 33 boroughs, 18 NHS organizations, and 22 others (museums, universities) (GLA, 2013). The programme has evolved into a EU-compliant procurement framework that shortens the procurement cycle and eliminates the costs and difficulties normally associated with public sector EE project implementation. RE:FIT is an example of the transformative potential of tweaking the Energy Performance Contracting model and adapting it to public sector procurement requirements.

Step 2. Developing Commercial-Scale Energy Performance Lending

Achieving Step 2 in the vision entails developing a commercial-scale lending framework for EE retrofit projects in a form that is scalable, unsecured, and non-recourse in nature. It must also be replicable in a variety of economic regimes throughout the world. The institutional vehicle for this phase is the Integrated Energy Efficiency Fund (IEEF or the Fund) described above, a commercial on-lending facility, which is expected to launch in Asia by the end of 2013. The Fund implements key aspects of an EE project finance vision including energy performance contracts, energy savings warranties, energy performance loans, and managed utilities agreements. A lead bank and syndicate of investors provide the loan capital, participate in the Fund's governance, and manage its operations.

Governance & transparency – The board of the fund governs all matters affecting the selection of program participants including the selection of additional providers of capital, originating banks, underwriting rules, loan terms, and other policies. The board is expected to include providers of capital, an

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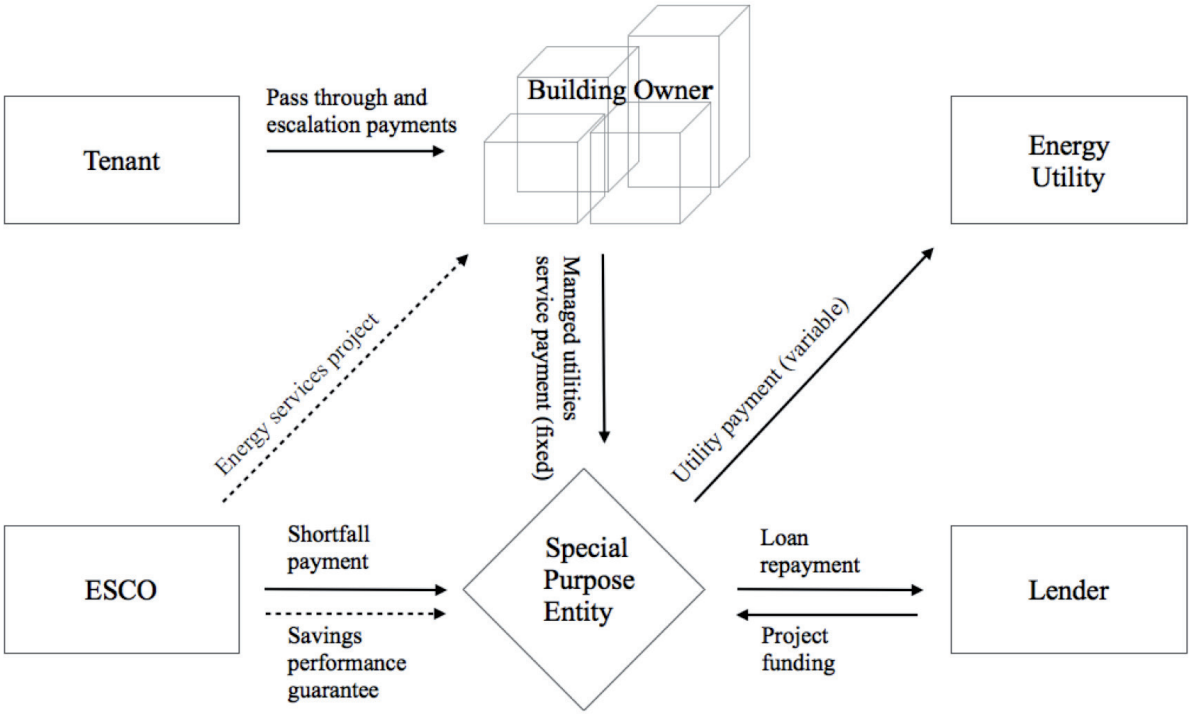

Figure 3. Managed utilities service agreement aligns financial interests of owners and tenants.

originating bank, and other advisors. To coordinate business practices across the region and facilitate communication, originating banks might form their own governance structure and are the fund's only borrowers. Originating banks are expected to market the program directly to existing customers and have complete discretion when opening new accounts.

While building owners take down the loans under repayment terms established by the providers of capital, they normally work with local community development banks with whom they are more likely to have existing relationships and who it is expected will originate and service most loans. Such local lenders will be the fund's direct customers, as they will submit conforming loan applications to the fund for approval, effectively using it as an on-lending facility. Investments in the Fund are expected to be profitable for investors as is originating and servicing of loans by local banks.

Project finance structure – EE projects have potentially three tiers of financing.

- Equity finance – building owner's maintenance and capital-improvement reserves.
- Debt finance – the fund.
- Gap finance – third parties.

An energy performance loan (EPL) serves as the debt finance tier and represents an opportunity for a bank to expand its existing business in the real estate sector. Obligors are building owners, typically small and medium size enterprises (SMEs) or investment managers. Repayment is funded by reductions in building operating expense. The loan is subordinated debt, added to existing mortgages and other senior debt, and does not require that owners refinance. Loans are funded by the fund, with unique underwriting requirements dictated by the providers of capital. Lending terms are set on a project-by-project basis and reflect project economics. Project savings cover debt service with minimum coverage ratio (DCR) of 1.1:1. Amounts financed, tenor, and interest rates are determined during the underwriting process. Interest accrued during project implementation (est. 6 to 18 months) is capitalized and added to project cost prior to computing debt coverage. Repayment starts only after savings begin to accrue.

Deal flow – Originating banks initiate deals, normally cross selling to existing mortgage and business line-of-credit customers. Building owners execute a conforming energy performance contract (EPC) with an approved prime contractor (ESCO) prior to completing an application and submit it to the originating bank. Originating banks then complete underwriting and submit approved projects to the Fund for disbursement. Funds are disbursed to the originating bank for on lending to the building owner. Loans are serviced by the originating bank, which repays the Fund.

Role of government policy makers – There is a potential enabling role for government, demonstrated by a program currently getting underway in Southeast Asia with backing from a founding EU member. The plan is for government grants to serve as a first-loss reserve in a special-purpose loan fund led by a large commercial lender. By reason of the loss reserve, a syndicate of capital providers and originating banks are expected to make loans under the new underwriting model until such time as the loan's performance and profitability are established. At that point banks are expected to fund their own reserves for losses, but based on actual experience rather than conjecture.

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There is also a role for central bank regulators in properly assessing the risk and approving use of the new underwriting framework by banks under their jurisdiction. Central bank policy with regard to the underwriting model is key to its widespread adoption.

CASE STUDY: CHICAGO MULTIFAMILY ENERGY RETROFIT PROGRAM

The Chicago Multifamily Energy Retrofit Program (MERP) is a partnership between CCI and the Chicago Department of Housing to provide owners of privately owned, affordable, multi-unit rental properties with financing and technical assistance for energy efficiency retrofits. The goal of MERP was to demonstrate a new approach to underwriting credit for energy efficiency projects that is replicable on a large scale in other jurisdictions. CCI recruited a syndicate of community development lenders led by JP Morgan Chase to develop a new set of credit underwriting rules for energy efficiency projects. The pilot fund consisted of five providers of capital contributing $1 million each and a $2.5 million first-loss reserve guaranteed by the City of Chicago and the MacArthur Foundation. By thinking about credit enhancement in new ways, the lending syndicate was able to design a loan underwriting process that minimized the owner's need to provide asset-based collateral, relying instead on project cash flows for most of the loan's security.

Because of the bank liquidity crisis, which crested in 2008, only the initial pilot was completed, a 314-unit project owned by Mercy Housing, which was contracted in November 2008 and completed in May 2009. The project cost $537 thousand, saving $31 thousand annually, reducing electricity use by 30 %, gas use by 12 %, and CO_2e emissions by 200 tons *per annum* (CCI, 2009). Given greater stability in the financial services industry, a similar effort is currently in the process of being developed under auspices of the British High Commission in Singapore involving a Southeast Asian banking syndicate, which is expected to attract between £120 million and £180 million in public and private loan capital (CCI, personal communication, 2013).

Step 3. Creating Investor Appetite for Energy Efficiency Returns

An expected result of commercial-scale EE project lending is not only a profitable new business opportunity for banks and investors, but also the emergence of a new inter-bank market in loan obligations based on the IEEF template. Given high-quality credits and favourable loan default experience, investment banks are expected to purchase debt obligations and package them for clients that are institutional investors and who have minimum size and credit-rating requirements. Packaging EE debt will be facilitated by the standardised underwriting process and loan contracts required by the IEEF.

CDOs based on EE debt represent an attractive investment banking business for many of the same reasons cited above for energy performance lending by mortgage and community development lenders – that is, EE debt is a managed risk and competitive differentiator for the bank with a social good attached to it that might appeal to institutional investors.

As the number of banks engaged in lending and securitizing EE debt expands, a competitive financial services market is expected to develop, which is based on the IEEF standard. With increasing competition, the amount of accessible capital is likely to increase and repayment terms are likely to improve, thereby lowering costs associated with financing EE projects. Given rapid knowledge transfer in the financial services industry globally, the new underwriting practices are likely to migrate to other regions in a short period of time.

Role of government policy makers – As some of the largest institutional investors globally include sovereign wealth funds and the pension assets of public employees, governments might one day find themselves in a position to direct their investment managers to consider EE debt that has been packaged for the institutional market. Doing so would create additional market pull for the EE projects, which back those investments.

Another potential enabling role for government is to facilitate the development of a secondary market for EE debt by backing new investment institutions that invest in EE debt. By becoming a lead investor in EE debt, governments can help legitimize a new EE asset class for investors within their borders and accelerate development of a positive feedback loop for EE projects in their region. Such intervention might be of particular interest to regions where the banking industry is still somewhat underdeveloped because the ability to sell loans to a government agency relieves the balance sheet of smaller banks and permits them to make additional loans.

CASE STUDY: KASIKORN BANK K-ENERGY SAVINGS GUARANTEE PROGRAM

Advised by CCI, Kasikorn Bank launched the K-Energy Savings Guarantee Program in 2011, based on EE projects contracted using the EPC model and ESCOs screened to meet criteria set up by the bank. It also uses similar underwriting criteria to the Energy Performance Lending – that is, energy savings generated by the project must be sufficient for loan repayment (a self-liquidating project). The bank has committed $100 million to the program. Most loans are structured as an operating lease. It is still somewhat early to judge the impact of the program, as few projects have yet to emerge from development and construction to produce savings.

The program extends a preferential credit limit of 100 percent of the total energy efficiency retrofit project investment, including hard and soft costs as well as ongoing M&V. Figure 4 schematically illustrates how the program structures repayment to generate a positive cash flow for the borrower whereby the repayment amounts are always lower than the guaranteed energy savings. That features enables building owners to benefit financially from the project from day one.

Conclusion

Every alternative to current sources of energy has some kind of liability, whether economic, environmental, or strategic which leads to the common observation that the cleanest, safest, and least costly energy is the energy we do not use. Analysts have concluded repeatedly that investment in conservation is perhaps the most cost-effective alternative source of energy, leading to its nickname "the first fuel." Yet, despite decades of progress in building technology, surveys of energy efficiency investment have shown it repeatedly falling short of rational expectations. This delivery gap is attributable to widespread

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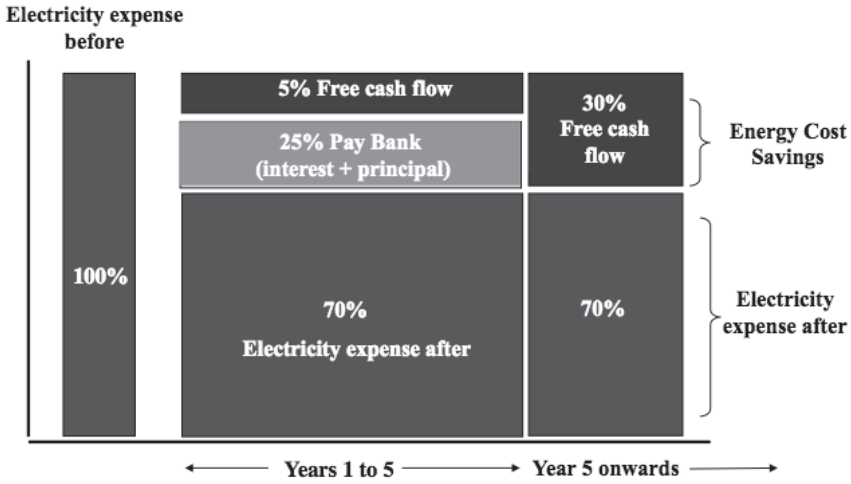

Figure 4. Savings attributable to EE program exceed the repayment amount.

perceptions of financial risk and uncertain performance. While a number of seemingly practical project finance prototypes exist, to date there has not been sufficient commercial-scale demonstration of those models to confirm their profitability at acceptable risk.

Evidenced by successful prototypes and pilots in major cities, it now appears that EE projects can be financed independent of local regulatory regimes and special-purpose incentives. The twenty-first century requires scalable and replicable commercial lending models to meet the challenge of low-carbon economic development. Commercializing EE project lending will require the financial services industry and its regulators to take a fresh approach to credit underwriting and experience is needed to test new risk models. The ultimate goal is to enable the existing-building sector globally to successfully reduce its carbon footprint in line with the United Nation's 2° scenario.

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Glossary

Debt coverage ratio (DCR) – Also known as *debt service coverage ratio* or simply the *coverage ratio*. In project finance, the ratio of cash flows generated by a project to it debt service. For example, a project generating EUR 1.1 million annually with annual debt service of EUR 1 million has a DCR of 1.1 to 1 and is sometimes abbreviated 1.1:1.

Debt service – The amounts required to repay a loan, usually the principal and interest due over time by contract.

Collateralised debt obligation (CDO) – The generic name for securities manufactured using loan obligations as their collateral.

Community development bank – A type of bank, typical in the U.S., which exists to serve the lending needs of the local real estate (property) sector. Often capitalized by a group of

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large banks to create a risk pool of real estate loans focused on the local community.

Credit underwriting – The process of evaluating a loan application to determine whether or not it meets the rules for approving loans set by the providers of capital.

Mortgage – Real estate loan, collateralized by giving title to the property to the lender

Non-recourse loan – Any loan which uses the legal borrowers assets as collateral – that is, terms of the loan do not allow the creditor to reach through and claim the borrower's personal assets in the event of a default.

Originating bank – A bank that markets loans and takes applications. Originators may or may not provide the loan capital. Some originating banks only serve as a distribution channel for the providers of capital.

Provider of capital – Loan investors that put money at risk. Providers of capital may or may not originate their own loans. Some capital providers may not have distribution capabilities.

Subordinated debt – Loan on a property which is junior to the first mortgage holder, sometimes secured by a 2nd, 3rd, or 4th mortgage. Also sometime unsecured by any collateral.

Securitisation – The process of creating a negotiable security using financial obligations, such as loans, as collateral for the new security. These securities are known as derivatives because they derive their value from an underlying contract.

Tenor (Term) – The time over which a loan must be repaid.

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