Innovations and Opportunities in Energy Efficiency Finance

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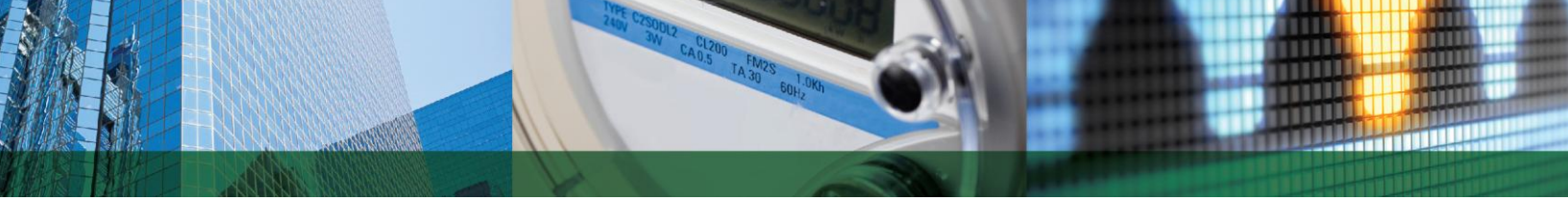
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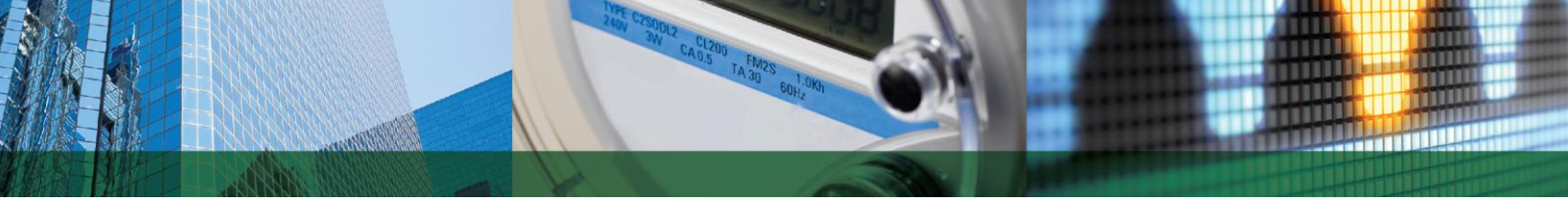

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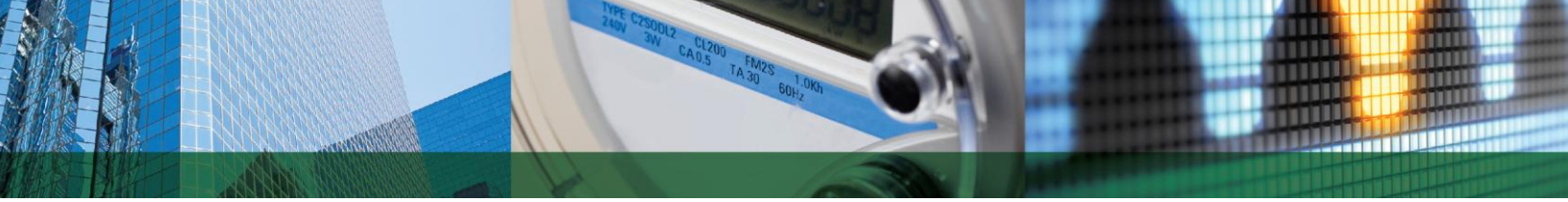
*The MESA structure was pioneered by Transcend Equity, which was acquired in 2012 by SCIenergy, and MESA is a trademark of SCIenergy.



Introduction

One year ago, we published our first white paper on energy efficiency finance with the twin objectives of introducing the subject to those for whom it was new, as well as discussing the principal concepts and methods for implementing energy efficiency finance with those already steeped in the subject or about to enter the market. That first primer remains a good starting point for anyone unfamiliar with energy efficiency finance. The purpose of this edition is to continue the conversation and, in particular, to examine where we are, what we have done, and where we are going.

Again, for anyone new to the subject of energy efficiency finance, we highly recommend starting with our 2012 white paper.[i]

In this 2013 edition, we will begin by updating our overview of the following energy efficiency finance models, taking into account significant developments in the past year:

(1) the energy savings performance contract (ESPC) model implemented by an energy service company (ESCO), and applying the real estate investment trust (REIT) structure to energy efficiency finance;
(2) the energy or efficiency services agreement (ESA) model;
(3) the managed energy services agreement (MESA) model;
(4) the Property Assessed Clean Energy (PACE) model;
(5) on-bill financing and on-bill repayment (OBF/OBR) approaches; and
(6) the Warehouse for Energy Efficiency Loans (WHEEL) structure.

While many other energy efficiency finance options also exist, these models continue to be among those attracting significant interest from both private-sector and public-sector stakeholders. As such, we will also discuss the main challenges, legal considerations, and opportunities associated with scaling and deploying these six models in the current business and legal environment.

We will also briefly examine evolving efforts to apply additional financing techniques that have attracted renewed attention—such as crowdfunding, securitization, master limited partnerships (MLPs), and REITs—to energy efficiency finance.

I. Energy Efficiency Finance Structures, New and Familiar, and Negotiating Key Agreements

Buildings account for approximately 40% of total U.S. energy costs, which are about $400 billion per year for residential and commercial buildings alone. The U.S. Department of Energy estimates that reducing energy use in U.S. buildings by 20% would save about $80 billion annually on energy bills, and savings from commercial buildings would account for about half of this amount.[ii]

Unlocking the potential $1 trillion market opportunity in energy savings,[iii] however, continues to face several challenges, not the least of which is the first-cost hurdle to the end-user. We include below in Figure 1 a summary diagram from our first white paper as a useful reminder of some of the major issues to which we will be referring as we consider how some of these risks and issues are being addressed, whether by applying tried and true techniques commonly used in other sectors to energy efficiency finance or by further developing existing energy efficiency finance models such as PACE or OBR:

Figure 1

First-Cost Hurdle	•How to finance the initial capital investment in energy efficiency measures at little or no up-front cost to the end-user •How to enable and incentivize the use of more efficient but potentially more expensive upgrades rather than lower-cost, lower-efficiency upgrades
Timing Mismatch	•How to overcome the mismatch between the longer useful lives and varying payback periods of some energy efficiency improvements (such as HVAC equipment) and the sometimes shorter expected occupancy of the property (whether by a property owner or a tenant)
Split Incentives	•Particularly prevalent in the commercial real estate sector, how to balance the different time horizons and incentives of a tenant versus a property owner
Scalability	•How to achieve scale by aggregation despite the often-fragmented and disparate nature of the targeted market and facilities
Existing Property or Financing Restrictions	•Restrictions under existing mortgages on mortgaged property or under existing debt financing to property owners
Energy Baseline Measurements	•Where payments to service providers and sponsors are based on performance, how to establish baseline energy usage and normalize for changes in energy consumption that are not related to the energy efficiency project

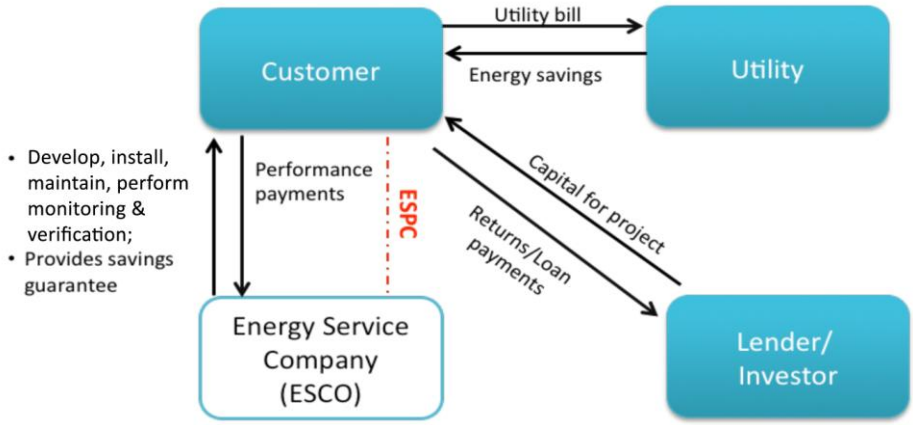
A. Energy Savings Performance Contracts (ESPCs) and Applying REITs to Energy Efficiency Finance

The ESPC model continues to dominate the ESCO energy efficiency market to date. According to a recent report by Pike Research, ESCO revenues in 2011 exceeded $5 billion and the ESCO market is forecast to reach at least $13 billion in sales by 2020 in the United States.[iv] About 73% of ESCO energy efficiency work occurs in mostly public buildings in the MUSH (municipalities, universities, schools, and hospitals) market segment, with U.S. federal government contracting work also driving a substantial portion of ESCO activity.[v]

Overview of an ESPC Structure

For ease of reference, we include below an illustrative ESPC structure and refer you to our 2012 white paper for a detailed description of the key features of an ESPC model. There have not been substantial changes to the primary features of the ESPC model in the past year.

Figure 2: ESPC Basic Structure



Sources of Financing and Applying a Familiar Model to Energy Efficiency Finance: REITs

As more fully described in our 2012 white paper, a wide range of debt financing, government incentives, lease financing, tax equity, rebates, and grants may be used to finance the customer's ownership of energy efficiency improvements under ESPCs.

One of the most interesting recent developments in this sector is the conversion by Hannon Armstrong, a well-known provider of debt and equity financing for energy efficiency projects, particularly in the MUSH and U.S. federal government markets, into a publicly traded REIT. On April 17, 2013, Hannon Armstrong Sustainable Infrastructure Capital, Inc. (Hannon) raised $167 million in an initial public offering as part of its intention to qualify as a public mortgage REIT. According to its prospectus, as of December 31, 2012, Hannon had more than $1.6 billion in managed assets in more than 225 sustainable infrastructure transactions. Hannon described its managed portfolio as being composed of about 58% financings for energy efficiency projects, 33% financings for clean energy projects (such as solar, biomass, other renewable resources, and combined heat and power), and 9% financings for other sustainable infrastructure projects such as water or communication projects, as of December 31, 2012.[vi]

The REIT structure is far from new, of course, having been established in 1960 initially to facilitate investment by small investors in real estate. Over the decades, REITs have evolved to permit the inclusion (on a case-by-case basis and subject to highly technical requirements that are beyond the scope of this white paper)[vii] of assets such as hotels, data centers, timber, cell towers, energy transmission, and certain other kinds of infrastructure. REITs allow individual investors to own shares in a portfolio of real property assets that derive real-estate-related income in a tax-advantaged manner. Unlike corporations, whose income is generally subject to tax and whose shareholders also generally pay taxes on their distributions, the taxable income of a REIT is effectively reduced, such that the REIT shareholders effectively pay taxes once, on the qualifying dividends that are paid to the REIT shareholders.

To qualify for this tax-advantaged treatment, however, a REIT must meet several complex asset and income criteria as defined and interpreted by the IRS. In its prospectus, Hannon states that it has obtained an applicable private letter ruling from the IRS.[viii] The specific wording of the Hannon private letter ruling (which, as of May 7, 2013, had not yet been published by the IRS) may serve as a useful indication of the IRS' general position for other REITs pooling energy efficiency financings or projects.

The possibility of interested and qualified investors being able to deploy and invest in REITs (i) to aggregate and pool energy efficiency assets across a variety of properties, without owning the underlying properties, or (ii) to use the underlying properties as collateral for a loan to finance an investment in energy efficiency at those properties, known as a mortgage REIT, is intriguing. It is also intriguing to consider whether a large REIT could have a small percentage of its assets (below the REIT asset and income test thresholds) consist of energy efficiency assets or financings. For qualifying energy efficiency assets and financings, REITs could potentially offer access to a wide range of investors, public or private, and could help achieve scale and aggregation in a tax-advantaged manner.

Given the complexity and cost of maintaining REIT status, in addition to the economics of generating sufficiently attractive returns for REIT investors, using a REIT structure would likely make the most sense for a large aggregation of energy-efficiency-related, qualifying assets. In addition to the current questions surrounding applicable private letter rulings from the IRS, there may be some uncertainty as to how REITs may be affected by tax law reform by Congress. It remains to be seen whether the IRS will allow a series of energy efficiency and other sustainable infrastructure investments to qualify as REIT assets on a case-by-case basis, possibly widening a pathway for more energy-efficiency-related REITs. Depending on the details of Hannon's private letter ruling and on the Hannon REIT's performance, it will be interesting to see to what extent a REIT approach is replicable in other market segments and with other energy efficiency assets and financings in the future.

Legal Issues

As part of its Dodd-Frank rulemaking process, the U.S. Securities and Exchange Commission (SEC) has proposed that ESCOs be required to register as "municipal financial advisors" and be subject to regulatory oversight as such. The ESCO industry continues to lobby for exempting ESCOs, like engineering firms, from this new registration requirement. The SEC has postponed the issuance of its final rule on the registration of Municipal Financial Advisors until September 2013.

Overall Assessment of ESPC Model

Strengths	Challenges
- Performance guarantees reduce project risks, which is valuable in large, complex retrofits - ESCOs have a long history of contracting experience and standardized processes - Projects are maintained through rigorous monitoring and verification	- Contractor and financier incentives limit deployment of new technology - High transaction costs - Long negotiation periods - Not a realistic framework for smaller projects - Does not incentivize energy or cost savings - Ongoing debate over whether ESCOs will be able to administer programs or originate loans without being registered Municipal Finance Advisors under the Dodd-Frank Wall Street Reform and Consumer Protection Act - On customer's balance sheet

B. Energy or Efficiency Services Agreements (ESAs)

The ESA model's innovation of translating the power purchase agreement (PPA) project financing approach into a contractual tool for third-party financing of energy efficiency improvements continues to gain market traction. As a result of the ESA model's success in commercial and industrial market segments, some innovators in energy efficiency finance have sought to use ESAs in connection with other financing strategies such as on-bill repayment (discussed in Section I.E below) and public/private financing integration (discussed in Section II.A. below).

Description and Key Features

In an ESA financing, the ESA provider arranges for the installation of energy efficiency measures by an ESCO and implements the capital investment in the project. The ESA provider develops, finances, owns, operates, and maintains the energy efficiency measures during the term of the ESA, while the host customer pays for the energy saved (sometimes referred to as "negawatts") as a service. The customer's payments are structured as a percentage of the actual energy savings achieved, either as a percentage of the customer's utility rate or as a fixed dollar amount per kilowatt-hour saved. While fixed $/kwh rates can insulate customers from future utility rate increases, they do not provide a hedge in the event of utility rate decreases. Figure 3 depicts a typical ESA structure.

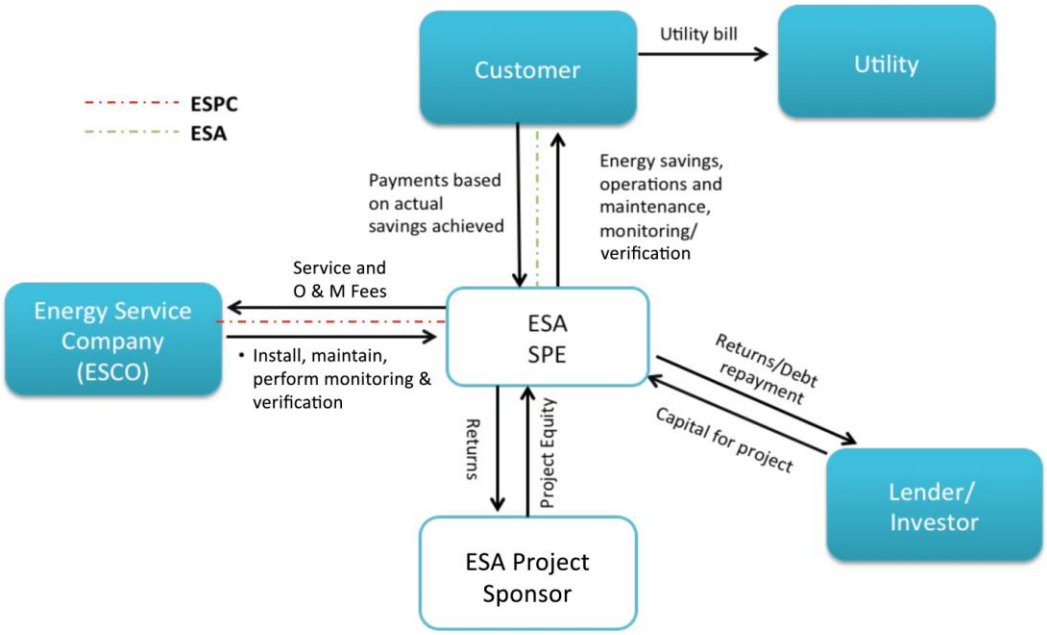
In an ESA, because the customer pays the ESA provider based on the actual amount of realized energy savings, there is an incentive to maximize the realized energy savings. As a result, this model may serve to encourage the implementation of newer technology that has been successfully piloted or demonstrated. Under certain ESA structures, the ESA customer has an option to purchase the energy efficiency improvements at the end of the ESA contract term for their then-current fair market value.

Sources of Financing

Both equity and debt investors may be involved in providing capital for the energy efficiency project through investments in a special purpose entity (SPE), which is typically established by the ESA provider for each energy efficiency project that is financed using an ESA structure. The SPE then owns the energy efficiency equipment and all rebates, tax incentives, or other government incentives. Third-party ownership of the energy efficiency equipment enables structuring approaches in which those incentives belong to an entity that can make the most use out of them. The tax benefits for energy efficiency equipment, however, are significantly less than for renewable energy generation, since energy efficiency improvements do not qualify for the investment tax credit (ITC) or production tax credit (PTC). As a result, tax equity investors, who are important financiers of solar and wind projects, are typically not a source of capital for energy efficiency projects.

Different debt financing providers may approach ESA projects with their own varying underwriting criteria and, as a result, a lender may require certain guarantees or other credit support from project participants. For small- to medium-size energy efficiency projects (typically for customers with less than $1 million in annual energy expenditures), which have been challenging to finance using private sector funds alone due to the relatively small amounts involved per project, an emerging source of financing is the CalCEF Efficiency Resource Fund (CERF), a pilot project jointly launched by Metrus Energy and California Clean Energy Fund (CalCEF). As discussed in Section II.A below, CERF is an innovative investment vehicle that aims to aggregate program-related investment funds from a variety of sources in order to finance small- to medium-size energy efficiency projects.[ix]

Figure 3: Basic ESA Structure



Investors are repaid through the stream of customer payments for energy savings, utility incentives, rebates, and environmental attributes. The creditworthiness of the customer and the ESCO will impact

the ability of the ESA provider to secure debt for an ESA-based project and the pricing of such financing. In some cases, parent guarantees or project performance insurance may be needed in innovative financing models until investors in this area become comfortable with their risk exposure. In an attempt to reduce transaction costs and expand investment into this segment, the market may increasingly see transactions in which a single investor funds groups of projects that meet certain criteria.

Accounting Issues

ESAs may be treated as services agreements, operating leases, or capital leases. Each ESA customer has to make its own determination of its accounting treatment of the ESA.

Overall Assessment

ESAs build on the successful PPA model of project finance, where third-party project developers and investors provide the up-front capital for energy efficiency improvements, which is repaid over time by a customer through energy savings.

Strengths	Challenges
- Customers may finance energy efficiency improvements off-balance sheet - Customers pay only for actual savings realized - Customers do not bear operation and maintenance responsibilities or performance risk during the ESA contract term - ESA providers are incentivized to maximize energy savings or other performance metrics - ESA provider may be able to monetize tax benefits that customer could not - ESA provider may be able to obtain financing for groups of similar energy efficiency projects that meet certain criteria from a single investor, thereby lowering transaction costs	- Each ESA customer has to make its own determination of its accounting treatment of the ESA - ESA provider has to secure debt financing from providers that understand the ESA model and source equity; familiarity with the well-established PPA model, however, may help mitigate this risk

C. Managed Energy Service Agreement (MESA)

The MESA model adds to the ESA model's successful application of the PPA structure to energy efficiency projects by having the MESA provider manage all of the customer's energy needs. Some MESA innovators are also exploring the possibility of using MESAs in connection with on-bill repayment (discussed in Section I.E below).

Description and Key Features

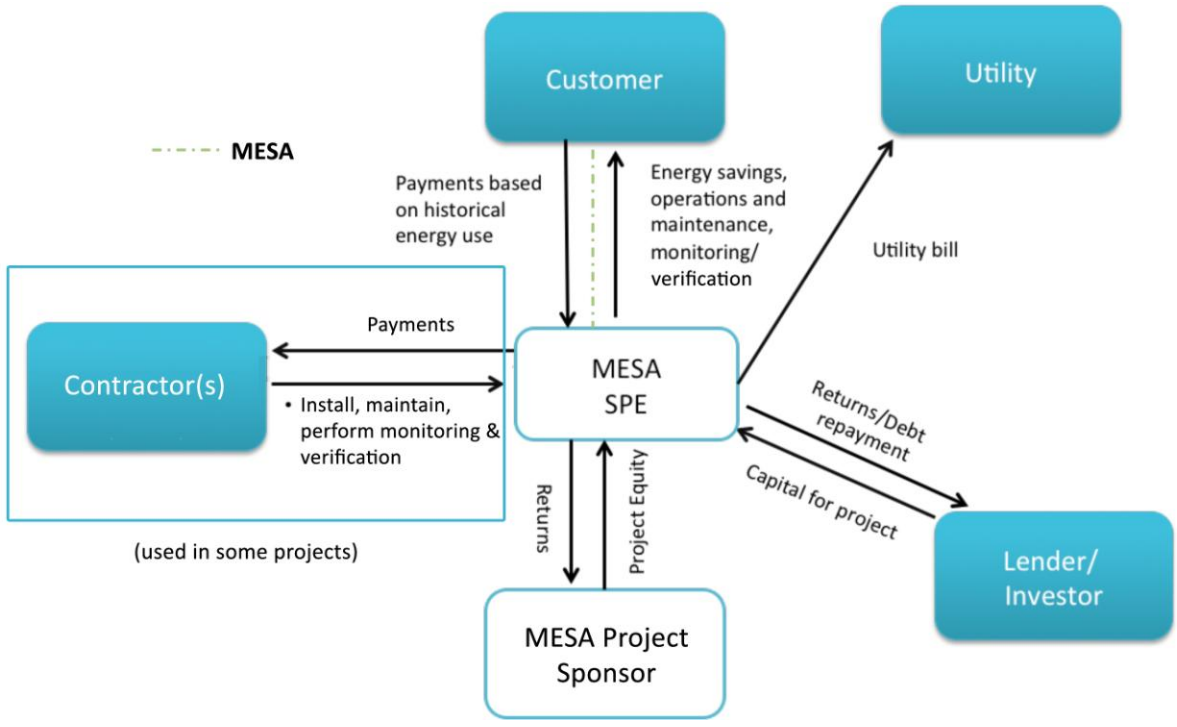
The MESA is a different version of an ESA, wherein the MESA provider owns the energy efficiency equipment (though the transaction does not always have to be structured this way) and in addition serves as a middle person between the customer and the utility by paying the utility bill directly for the host. With a MESA structure, the customer has the MESA provider as a single point of contact and

makes a single payment for all of its utility expenses, which is based on their historical average. The MESA structure overcomes the split incentives hurdle in a multi-tenant building when the property owner can pass through MESA charges to tenants, since the MESA is an operating expense. As with an ESA, MESAs involve the sale of energy savings as a service and are often structured as off-balance sheet arrangements at this time. Companies with a fully integrated business model (e.g., technology provider, developer, and financier) that want to enter the energy efficiency market may find it most attractive to utilize the MESA structure to fund energy efficiency projects.

New companies in this space have established varying arrangements for how energy savings could accrue to the customer. Under one structure, the customer pays the MESA provider its baseline average historical energy bill for the duration of the contract, and all savings accrue to the MESA provider. In other models, the MESA provider guarantees a percentage reduction in energy bills to the customer, thereby sharing in the energy savings throughout the contract period.

Figure 4 below provides an illustrative MESA structure.

Figure 4: Basic MESA Structure



Sources of Financing

The MESA provider may finance a MESA project using the same strategies as an ESA provider does as described above, including the establishment of an SPE for each MESA project. MESA projects may attract lenders because the structure does not require them to take risk on utility rates, as rate rise/fall is passed through to the owner on a transparent basis. As with the ESA structure, since energy efficiency improvements do not qualify for the ITC or PTC, unlike solar and wind-generation projects, tax equity investors are not a primary source of capital for MESA energy efficiency projects. In some cases,

Section 179D remains a viable means of bringing up to $1.80 per square foot in tax deduction to clients, which allows a MESA provider to drive a deeper, more holistic retrofit.

A MESA project may be financed using a variety of sources. Mitsui & Co. (U.S.A.) Inc. and SCIenergy, for example, have entered into an innovative joint venture to target energy efficiency retrofit projects in privately owned buildings using the MESA model. Credit enhancement can also be used to finance a MESA project.[x]

Overall Assessment

Strengths	Challenges
- Customers may finance energy efficiency improvements off-balance sheet - Customers do not bear performance risk during the MESA contract term - Project sponsors are incentivized to maximize energy savings - Customer has a single point of contact and a single payment for all utility expenses - Will address the split incentives hurdle in multi-tenant buildings	- Each MESA customer has to make its own determination of its accounting treatment of the MESA

D. Property Assessed Clean Energy (PACE)

PACE was developed in 2007 and enables local governments to finance energy efficiency improvements using land-secured special assessment or improvement district structures. The authority to create land-secured municipal finance districts already exists in most states around the country and has been used as far back as the 17th century to finance local improvements such as sewer lines, sidewalks, seismic retrofits, fire safety improvements, parks, and sports arenas. Under such authority, local governments issue bonds to finance local improvements that have a public purpose and levy assessments against property that benefits from such improvements. The assessments are collected along with property taxes and are secured by a lien on the property.

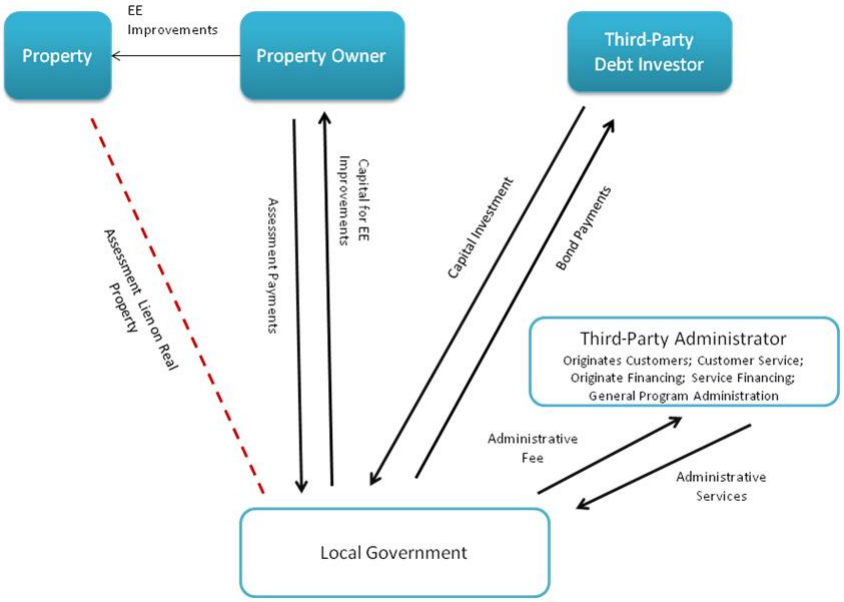
Commercial PACE programs have launched around the country, and thus far over 150 projects have been financed via Commercial PACE, representing over $30 million in investments.[xi] Actions taken by Fannie Mae, Freddie Mac, and the Federal Housing Finance Agency (FHFA) have presented hindrances to the implementation of PACE in the residential sector, as discussed below.

Description and Key Features

In a PACE program, existing municipal improvement district authority typically is expanded to include energy efficiency or renewable energy improvements on private property. These districts generally are established as a result of petition or vote of constituents or property owners in a local jurisdiction and then approved by the governing body of that jurisdiction. Property owners voluntarily agree to have

assessments levied against their property in exchange for receiving the up-front capital for the energy efficiency improvements.

Figure 5: Basic PACE Structure



In the event of a sale or transfer of the property subject to the PACE assessments, the lien securing the assessments remains on the property, becoming an obligation of the next property owner. Thus, the repayment obligation is tied to the entity benefiting from the energy savings achieved at the property. As with other tax and government assessment liens, liens used to secure PACE assessments are senior to privately held liens such as mortgages. This security feature reduces risk to bond investors and lenders, thereby enabling local governments to offer this financing at attractive interest rates. It is important to note, however, that as with property taxes, in the event of foreclosure, only the past due assessments are paid out of the proceeds of a sale ahead of the first mortgage (i.e., rather than the full remaining balance of future assessments). This feature is often referred to as "non-acceleration."

The term of PACE assessments is generally tied to the payback period for the energy savings measure, in some cases as long as 20 years. There is no clear consensus yet from the accounting community as to whether PACE assessments should be treated as on-balance sheet or off-balance sheet.

Legal Issues

PACE gained a great deal of popularity and momentum beginning in 2008, with 27 states[xii] around the country passing legislation to expand existing land-secured municipal improvement district authority to enable local governments to establish PACE programs.

For the commercial sector, PACE programs have been implemented on a statewide basis in California, Connecticut, Florida, and Michigan, and on the local level in numerous cities and counties around the country. These programs typically require mortgage-holder consent, acknowledgment, or notice of the senior PACE lien, and are available in the commercial, multi-family residential, and industrial sectors.

In the single-family residential sector, the implementation of PACE programs has been hampered by actions taken by Fannie Mae, Freddie Mac (the GSEs), and the FHFA. In 2010, the GSEs issued advisory statements to lenders and servicers of mortgages owned or guaranteed by the GSEs stating that PACE programs were inconsistent with the GSE's uniform security instruments because of the seniority of PACE liens. The FHFA, the agency authorized to regulate and act as the conservator of the GSEs, then issued statements upholding the GSEs' advisories, concluding that PACE programs present "safety and soundness concerns," and directing the GSEs to refrain from purchasing mortgages on properties with outstanding PACE liens and to take "prudential actions," such as tightening debt-to-income and loan-to-value ratios in communities offering residential PACE programs. These actions had the effect of halting the implementation of most PACE programs in the U.S. residential sector. The State of California and numerous local governments from around the country brought suit in federal court, and as a result the FHFA began a formal rulemaking proceeding on PACE. The Second, Eleventh, and Ninth Circuit Courts of Appeals held that because the FHFA was acting in its role as conservator of the GSEs, courts could not restrain the FHFA's actions. While some local governments have continued to offer PACE in the residential sector and provide disclosures to homeowners regarding the risks associated with the FHFA's actions or to restrict programs to properties not subject to a GSE-conforming mortgage, other communities have decided not to pursue residential PACE unless the FHFA modifies its position on PACE, or to offer clean energy financing programs that involve subordinate liens. The FHFA's actions do not impact PACE programs in the commercial sector.

Sources of Financing

PACE improvements are financed via the issuance of bonds by local governments under land-secured municipal improvement district authority. Third-party entities typically work with the local government to arrange for lines of credit, capital warehouse facilities, project origination, and administrative processing. As discussed above, assessment liens are attractive security instruments to the capital markets and lower the effective cost of capital to property owners. Several jurisdictions are permitting commercial property owners to arrange financing directly with lenders. In fact, some existing mortgage holders are expressing an interest in providing PACE financing to properties in their portfolios. Local governments have explored the use of additional credit enhancements, such as loan loss reserves, guarantees, insurance, and interest rate buydowns, to lower borrowing costs and reduce default risks to mortgage holders. PACE financings have the potential to evolve into standardized instruments that can be securitized and sold in the secondary markets.

Overall Assessment

PACE is a promising energy efficiency financing structure with enormous potential to scale energy retrofits. In the commercial, multi-family residential, and industrial sectors, PACE programs are advancing across the country, with over 150 projects funded and over $30 million invested in commercial PACE to date. The implementation of PACE in the residential sector has been limited as a result of the FHFA's actions.

Strengths	Challenges
- Assessment lien is attractive to investors; security feature enables competitive interest rates - Repayment obligation remains with property in the event of sale or transfer by owner - Term tied to payback period - Potential for securitization	- FHFA position has restricted implementation in the residential sector - Local government approval process required to implement program - No consensus yet regarding accounting treatment as on-balance sheet or off-balance sheet

E. On-Bill Financing/Repayment

On-Bill Financing/On-Bill Repayment (OBF/OBR) uses utility or third-party capital to pay for energy efficiency or renewable energy retrofits in a building, the cost of which is repaid by the customer on the customer's utility bill. OBF refers to programs that use utility capital, whereas OBR programs leverage third-party capital. To date, various forms of on-bill programs have been implemented in over 20 states, serving residential, commercial, and industrial customers.

The past year has seen the establishment or approval of new OBF/OBR programs, as well as the expansion of such programs past pilot stages. OBF/OBR has continued to feature very low default rates and low borrowing costs, and some programs have begun to explore combining OBR with other financing models such as ESAs or MESAs in order to allow ESA/MESA developers to consider credits that would not be financeable without the OBR program. States appear to be favoring a tariff structure rather than a loan structure when possible (described below) to minimize regulatory barriers, facilitate the transferability of OBF/OBR obligations, increase customer demand, and attract private sector financing; however, overall market penetration of OBF/OBR remains low.

Description and Key Features

Although OBF/OBR programs vary significantly, key elements include (1) repayment of the costs of building energy efficiency retrofits through the customer's utility bill; (2) minimal or low up-front costs and interest rates; (3) threat of utility disconnection in the event of default; and (4) use of utility or third-party capital for the initial cost of energy efficiency retrofits (see "Sources of Financing" below).

The central feature of OBF/OBR programs is that repayment for energy efficiency improvements is bundled into the customer's monthly utility bill. This feature allows customers to immediately see the effect of energy efficiency improvements on their overall energy expenditures, which often decrease immediately due to low interest rates and minimal up-front costs for the customer. Because customers

are able to quickly realize the economic benefits of energy savings, OBR/OBF addresses the "first-cost" hurdle to energy efficiency retrofits and expands customer demand. The utility bill repayment mechanism also lowers certain administrative costs by leveraging the existing infrastructure and resources of the utility (which typically administers the program or partners with the administrator), including customer relationships and billing systems.

Another key element of most OBF/OBR programs is the threat of utility disconnection: customers tend to place a high priority on utility bill payments due to the threat of shutdown, and because OBF/OBR payments are bundled into the utility bill, default rates for OBR/OBF programs have been exceedingly low to date (mostly 0-2%). This feature of OBF/OBR is credited with lowering borrowing costs and extending energy efficiency retrofits to parties that might not otherwise have been deemed creditworthy. As discussed below, the availability of service disconnection, particularly in the residential sector, may be subject to legal restrictions in some jurisdictions.

Within this basic framework, OBF/OBR programs vary significantly. In addition to variation in sources of financing (discussed below), programs are administered by various types of entities (e.g., utilities, government agencies, or other third parties) and may target different types of customers, buildings, and technologies. For example, New York's Green Jobs Green New York (GJGNY) program, which is administered by the New York State Energy Research and Development Authority (NYSERDA), targets residential buildings, multi-family residential buildings, and nonprofits and small businesses, with different eligibility requirements, loan sizes, and payback periods for each. In comparison, California's OBF programs, which are administered by investor-owned utilities, only extend loans to business customers, while the OBF program recently approved by the Hawaii Public Utilities Commission[xiii] is only open to residential customers, with a focus on single-family homes and townhomes. The types of retrofits and technologies covered by OBF/OBR programs vary as well: a number of programs specifically exclude lighting and non-permanent fixtures, while others also cover renewable energy installation (e.g., Hawaii's program, which includes solar thermal hot water and solar photovoltaic installations in addition to permanently installed energy improvements).

One key difference between programs is whether the customer's payment is characterized as payment on a loan or payment for a service, which has implications for the regulations of utilities and the transferability of the OBF/OBR payment obligations. In on-bill loan programs, the program administrator extends financing to an individual or company. The obligation to repay may be non-transferrable, even if the customer sells or ceases to occupy the building, unless there are provisions in the program or its enabling legislation that allow for such transfer. On-bill loan programs may also subject the administrator to lending laws, as discussed further below.

In contrast, under on-bill tariff programs, the payment is structured as a tariff that the customer pays in return for energy efficiency services. The obligation to pay is tied to the property or utility meter and transfers to subsequent owners or occupants. For example, the Oregon MPower program is set up such that the utility pays all of the up-front costs for retrofitting a multi-family residential building. The building owner agrees to a 10-year tariff, which is pro-rated across all of the meters in the building, and addresses the division of energy savings in rental agreements with tenants. On-bill tariff programs typically include notice requirements for future owners or occupants. In Midwest Energy's How$mart program, for example, Midwest Energy files a Uniform Commercial Code form with the county register to provide notice of the OBF/OBR obligation, while Vermont's PAYS® program allows subsequent tenants or owners to break a lease or purchase agreement if the landlord or previous owner failed to

provide notice. An advantage of the tariff structure is that it removes the disincentives to OBF/OBR based on whether the property is leased or the expected duration of ownership, and reduces the emphasis on the building occupant's creditworthiness as a determining factor in the application. However, owners and utilities may remain concerned about the treatment of tariffs during periods when the building is unoccupied by tenants or upon transfer of the property. Furthermore, although OBF/OBR program administrators in several states (e.g., Vermont and New Hampshire) have taken the position that state laws and regulations allow for the tariff to run with the meter, the extent to which a tariff obligation is transferable is a state-by-state inquiry and remains unsettled in many jurisdictions.

Sources of Financing

Existing OBF/OBR programs rely on a mix of public, private, and ratepayer funds. Many programs currently rely on public capital, such as revolving loan or public benefits funds, some of which are capitalized with ARRA funds and continue to draw from federal loans, bonds, or grants. These funds typically cover the up-front costs of retrofits and energy audits and may provide credit enhancements, such as loan-loss reserves or payment guarantees, to manage default risk and reduce borrowing costs.

Community Development Financial Institutions (CDFIs), which serve a community development purpose and often lend at lower interest rates and expected returns, have also played a role in administering OBF/OBR. Clean Energy Works Portland, for example, is an OBF/OBR program in Oregon that is administered by a CDFI using $3 million in federal stimulus dollars, and provides loans to parties that could not have obtained financing for energy efficiency from traditional lenders. To a lesser extent, some utilities use ratepayer capital for OBF/OBR, though concern has been expressed that this practice could expose utilities to lending laws, and it has not been widely adopted. Finally, some larger banks have expressed interest in investing in appropriately structured OBR programs. The involvement by larger investors and the capital markets is expected to grow once volume increases and OBR agreements become more standardized.

New York provides an interesting example of OBF/OBR financing because of the combination of financing sources on which it relies. GJGNY was started with seed funding from proceeds from the Regional Greenhouse Gas Initiative (RGGI), a cap-and-trade program in the Northeast that has allocated $112 million to GJGNY's revolving loan fund; in addition, $18.6 million has been allocated from the U.S. Department of Energy's (DOE's) Better Buildings grant. In addition to energy audits and retrofits, GJGNY provides credit enhancements through a separate loan-loss reserve that draws from ARRA funding. The objective is for these credit enhancements to eventually make the GJGNY revolving loan fund attractive to the capital markets.

OBR programs can also be structured to accommodate other energy efficiency financing structures, such as leases, PPAs, ESAs, and MESAs. In such circumstances, ongoing payments to the ESA project developer could be made on the utility bill. For example, the City of Seattle's Community Power Works (CPW) program features ESAs, payments on which are made through Seattle Steam Co. utility bills. A notable characteristic of the CPW program is that Seattle Steam Co. has agreed to subordinate its steam charges to the ESA payments to its partners under the CPW program, with the view that offering OBF/OBR and lowering customer rates would improve customer retention. In circumstances where OBF/OBR is combined with other financing mechanisms, or with other energy efficiency or renewable energy incentive programs, it is important to streamline the programs to minimize customer confusion and administrative costs.

Legal Issues

Although utility service disconnection reduces default rates in OBF/OBR programs, this practice may be restricted by statute or regulation for certain customer segments in certain jurisdictions. Another legal issue at play with OBF/OBR is the application of state and federal consumer lending laws when the financing is structured as a "loan." California utilities, for instance, received an exemption from the California Finance Lenders Law from the California Department of Corporations when the utilities lend to commercial entities and charge 0% interest and no fees.[xiv] When structured as a tariff, on-bill programs may avoid lending laws; this question has not yet been tested in the courts. Tariff-based programs also require regulatory approval from the relevant entities. In addition, the structure of the OBF/OBR program as a loan or an energy payment will impact its accounting treatment for the customer as on-balance sheet or off-balance sheet.

Overall Assessment

To date, OBF/OBR programs have been successful in maintaining very low rates of default, achieving bill neutrality, and reaching underserved customers. Some keys to this financing model's success seem to be the ability to combine multiple funding sources within one program and to target multiple building sectors, which increases project volume. However, overall market penetration has remained low—approximately 1% of eligible customers.[xv]

To scale up, OBF/OBR must overcome a number of barriers. Administrative costs remain high, particularly for programs that serve residential customers, due to the need for individual energy audits and new billing structures (in some cases), and the lack of standardized agreements. Many programs still rely on government funding, which reduces sustainability, and attracting third-party private capital continues to be challenging due to non-standard underwriting criteria and uncertainty regarding the transferability of OBF/OBR obligations. And while pilot programs have had low default rates, there are a number of matters that would need to be dealt with more thoroughly to make OBF/OBR viable on a larger scale, including financial and consumer protection regulations, allocation of risk in the event of default, priority of OBF/OBR-related payments as compared to customers' regular energy bills, transferability of obligations, and ways to ensure positive cash flows.

Strengths	Challenges
- Addresses "first-cost" hurdle to customer adoption by requiring little capital up front - Shows strong record of repayment by customers to date - Can be structured to use third-party capital at no cost to taxpayers or ratepayers - Leverages existing utility resources and customer practices to collect payments - Bundled utility bill clearly shows impact of energy efficiency on overall energy expenditures - Expands access to retrofits and lowers cost of capital because threat of utility shut-off leads customers to prioritize utility payments - Payment obligation may follow the customer or the meter - Can accommodate a variety of financing structures, including ESAs and MESAs - Can be structured to address diverse customers and market segments - Can be structured to address split energy incentives of tenants and owners - Accounting treatment may be on-balance sheet or off-balance sheet	- Threat of utility disconnection may be subject to legal restrictions in some jurisdictions - May require up-front investment by utility to reform billing structures and other systems - Ensuring that energy savings will exceed loan/tariff payments is difficult - Potential consumer lending regulations increase legal costs and uncertainty for loan structure - Obtaining landlord buy-in may be difficult if the tenant reaps all of the energy efficiency benefits - Existing programs rely heavily on government funding and support - Scalability may be constrained by unorthodox metrics for assessing risks of default - Legal uncertainty exists in many jurisdictions regarding transferability of OBF/OBR obligations in the event of transfer, foreclosure, or bankruptcy

F. Warehouse for Energy Efficiency Loans (WHEEL)

The Warehouse for Energy Efficiency Loans (WHEEL) is an emerging energy efficiency finance structure that seeks to leverage public or ratepayer funds to provide low-cost, large-scale capital to state and local government and utility-sponsored residential energy efficiency loan programs. The initial launch of WHEEL is being prepared in Pennsylvania, and is being financed and implemented by Renewable Funding.

Description and Key Features

WHEEL is modeled after the same method of financing used for a wide array of consumer borrowings, including autos, mortgages, and credit cards. Under this model, a special-purpose entity purchases unsecured residential energy efficiency loans (such as Keystone Home Energy Loan Program (HELP) loans) from loan originators. To fund the purchase of these loans, the special purpose WHEEL entity borrows from both private and public sources. The public sources of debt can include state moneys (such as remaining ARRA funds or other public funds directed to finance energy efficiency improvements), local funds, or funds provided by utility ratepayers or other public utility commission-

directed funds. The key innovation in the WHEEL model is that public sponsor funds take a subordinate position to the private debt, thereby attracting investment-grade capital to the structure. This allows for low-cost, large-scale capital to flow to the programs WHEEL supports.

WHEEL currently anticipates single-digit interest rates for consumers. This interest rate can be further reduced via additional credit enhancements from the public sponsor. Loans with terms of five, seven, or ten years can be included in WHEEL.

WHEEL is structured to enable residential energy efficiency loans to be pooled, securitized, and sold in the capital markets. The proceeds of the sale of investment-grade rated debt are then recycled back into the warehouse, enabling the purchase of additional residential energy efficiency loans. By leveraging public funds and creating a secondary market for energy efficiency loans, WHEEL has the potential to bring large sources of private capital to the table and reduce borrowing costs to homeowners interested in retrofitting their homes.

Sources of Financing

Senior debt in WHEEL is provided by large institutional investors, while credit enhancement can be sourced from several different entities. Credit enhancement for WHEEL can be provided through a variety of state and utility sources, including federal funds (e.g., ARRA), state conservation or energy efficiency funds, utility ratepayer funds, or funds provided by local or other public agencies. The Department of Energy has issued guidance permitting state sponsors to use Energy Efficiency and Conservation Block Grant and State Energy Program funds to support the purchase of loans into WHEEL, and clarifying that revenue that flows back to sponsors is not subject to DOE or ARRA requirements for the use of such funds.[xvi] In addition, ratepayer funds administered by utilities or utility commissions can provide subordinate debt to the WHEEL structure. The California Public Utilities Commission is considering using up to $24 million in ratepayer funds as part of a pilot program targeted to energy efficiency improvements to fund WHEEL.[xvii] As compared to programs utilizing other credit enhancement models such as loan loss reserves or guarantees, WHEEL provides public sponsors with potential upside gain due to interest earned on the loans and is therefore likely to require a lower net public subsidy.

WHEEL is organized to tap into the capital markets by issuing investment-grade rated securities backed by the underlying consumer energy efficiency loans. Investors may include pension funds, insurance companies, and large money managers. By selling into the capital markets, WHEEL generates more funds available to purchase energy efficiency loans, thereby recapitalizing the funds established to provide energy efficiency financing to homeowners. This structure is intended to bring large pools of capital into the residential retrofit markets.

Legal Issues

Because WHEEL relies on public agency sponsors to provide credit enhancement, standard political processes and governmental approvals are required to utilize WHEEL financing. Depending on the type of public sponsor or specifications regarding the source of funds, this process can be time-consuming. WHEEL is designed to comply with all issues related to sponsor funds, as well as all legal issues associated with securitization transactions involving consumer debt, including compliance with securities, consumer finance, privacy, and other laws and regulations.

Overall Assessment

WHEEL is a promising new twist on an old financing model that could bring large pools of capital to the single-family residential energy efficiency market. By incorporating public sources of financing in a subordinate position, WHEEL is poised to deliver energy efficiency finance at much larger scale and a lower cost of capital. And by securitizing this new asset class of home energy efficiency loans, WHEEL can recapitalize public energy efficiency loan pools, thereby leveraging public funds and increasing the overall financing potential.

Unsecured residential energy efficiency loans are a new asset class, and little direct data on the performance of these loans is available. It can take three to seven years of loan history for rating agencies to fully evaluate the credit of a portfolio. Over time, WHEEL will provide the capital markets with data on the performance of this asset class, enabling rating agencies to more accurately assess risk on the asset class. If the data shows strong performance, interest rates will be further reduced and public subsidies may no longer be necessary.

Thus, WHEEL is an innovative concept intended to address the significant need for low-cost financing in the single-family residential energy efficiency markets with a great deal of potential. Because it is still under development, however, the efficacy of WHEEL is as yet unproven.

Strengths	Challenges
- Addresses the "first costs" hurdle by leveraging public or ratepayer funds to reduce interest rates on residential energy retrofit loans - Scalable: loans can be standardized and securitized, creating a secondary market in residential energy efficiency loan assets - Taps into capital markets to bring large sources of capital to energy efficiency finance - Provides public sponsors with upside potential on credit enhancement funds, reducing net subsidy	- Requires public agency approval, which can be time-consuming and subject to political processes - New asset class, not yet familiar to rating agencies

G. Other Potential Energy Efficiency Finance Structures

Crowdfunding

"Crowdfunding" has garnered increased attention in recent months as a novel way of financing businesses and projects, including in the renewables industry. Mosaic, a well-known example, recently announced that it received regulatory approval in the State of California to raise up to $100 million from California residents to fund solar projects.[xviii] As of the time of this writing, we are not aware of a specific energy efficiency project funded through crowdfunding, but we believe it worthwhile to provide a brief introduction given the emergence of this financing structure and its potential applicability to energy efficiency finance.

As commonly used, "crowdfunding" refers to private companies raising capital from a large number of investors through a web-based platform, often in smaller dollar increments and from smaller investors than are typical of private company securities transactions. These transactions are facilitated by a number of recent changes and proposed changes to federal securities laws, e.g., pursuant to the Jumpstart Our Business Startups Act of 2012 (the "JOBS Act"). For example, while general solicitation was previously disallowed for most private securities offerings, the SEC has issued proposed rules pursuant to the JOBS Act that offer more flexibility to private companies to engage in a broader range of communications with prospective investors, so long as they take reasonable steps to ensure that the purchasers of the securities are accredited investors. The JOBS Act also eases certain broker-dealer registration requirements to allow securities to be traded on certain web-based platforms without the platform having to be a broker-dealer. Furthermore, Title III of the JOBS Act (the CROWDFUND Act) specifically allows private companies to raise money in fairly small increments from unaccredited investors through online "funding portals" without registering these securities, so long as a number of information disclosures and other investor-protection-oriented requirements are met.

Crowdfunding is in its early stages, and its impact remains to be seen. The SEC has yet to promulgate regulations implementing key elements of the JOBS Act changes, including the CROWDFUND Act, and the legislative and regulatory changes are relatively narrowly tailored, so that the process requirements for issuers to achieve significant scale will likely remain subject to the pre-existing regulatory framework to a large extent. However, just as the principles of third-party financing structures developed in the solar industry have been applied to address the up-front costs of solar, we believe that crowdfunding has the potential to become a useful financing mechanism for energy efficiency as investors become more familiar with the financing structures and risks associated with energy efficiency finance. If that happens, crowdfunding would allow capital to be raised for particular energy efficiency projects from investors who would not typically be able to engage in project finance or in venture capital investing.

Master Limited Partnerships

Master Limited Partnerships (MLPs) are a business structure that is popular in the oil, gas, and mineral industries. MLPs provide the single-level taxation of a partnership, and interests in MLPs may be traded on a stock exchange or over the counter. MLPs provide a number of benefits to both the sponsoring company and the investors, including avoidance of partnership-level taxation and increased liquidity for investors. The lack of an entity-level tax frees up cash for distributions or asset and business acquisitions, and because they are publicly traded, MLPs allow companies to raise capital from smaller, qualifying investors to fund acquisition and maintenance of certain traditional energy and natural resources projects.

The MLP structure is made possible by Internal Revenue Code Section 7704, introduced in 1987, which currently limits MLPs to projects that derive qualifying income from certain oil, gas, biofuel, industrial source carbon dioxide, and mineral and natural resources. Congress targeted these resources in order to increase investment in areas it believed were in the country's strategic interest and that could provide steady returns over time.

In April 2013 , Senators Christopher Coons (D-DE) and Jerry Moran (R-KS) introduced a bill to expand the definition of MLP qualifying income to include renewable energy and revenues from building energy efficiency projects that comply with the requirements of Internal Revenue Code Section 179D. While developers may face significant hurdles meeting the requirements of Section 179D without other legislative changes should the bill be signed into law, energy efficiency investments fit the policy criteria underpinning the current and proposed expansion of the scope of MLPs. With adequate legislative clarity, the ability to use MLPs as vehicles for financing energy efficiency projects could represent a significant federal incentive. Furthermore, energy efficiency projects are increasingly integrated with renewable energy projects, and enabling MLPs to include these integrated assets among their investments may provide another method of financing energy efficiency projects.

While the proposed MLP Parity Act enjoys bipartisan support, passage in Congress risks becoming entangled with broader efforts at tax reform. In addition, as some commentators have noted, the bill does not propose to modify the passive activity limitations on credits and losses for individual investors.

H. Appraisals and Insurance

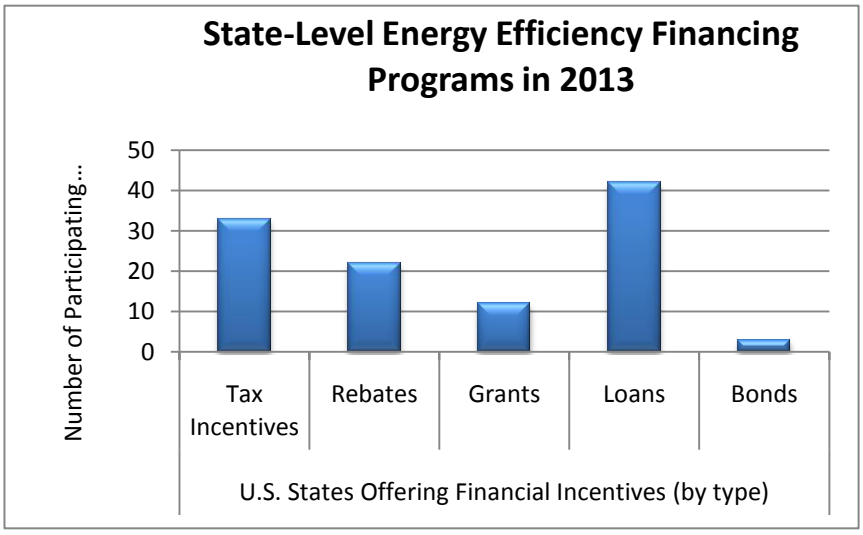
Since the measurement and verification of energy efficiency savings and costs are critical decision points for both the customer considering whether to implement an energy efficiency improvement and the providers of energy efficiency finance, continued innovation in these areas will provide crucial tools to facilitate energy efficiency financings.

One example of a critical development with a potentially significant impact on energy efficiency finance that has recently received increased attention is the appraisal process for properties. Under uniform national standards, appraisals must include the value of energy efficiency and renewable energy improvements.[xix] The appraisal industry has evolved to enable appraisers to account for the resale value of energy efficiency and renewable energy improvements.[xx] For example, in 2011, the Appraisal Institute issued a “Residential Green and Energy Efficient Addendum” to the Uniform Residential Appraisal Report (Fannie Mae Form 1004), which facilitates the process of determining the value of clean energy improvements and making comparable sales analyses.[xxi] In 2010, the National Association of Realtors launched a “Green MLS Tool Kit,” which facilitates the inclusion of energy efficiency and renewable energy improvements in the regional Multiple Listing Service (MLS) databases.[xxii] In June 2011, the Appraisal Foundation, a key source of national appraisal standards, and the U.S. Department of Energy’s Office of Energy Efficiency and Renewable Energy announced a Memorandum of Understanding (MOU) to cooperate on creating guidelines under the Uniform Standards of Professional Appraisal Practice for green appraisals and energy performance. This MOU has resulted in a change to the licensure requirements for appraisers, which now require education regarding energy efficiency improvements.[xxiii] The Appraisal Institute now provides extensive educational programs to assist appraisers in valuing residential clean energy features as required under the Uniform Standards of Professional Appraisal Practice.[xxiv] Because of the fundamental gatekeeper role that appraisals play in property valuations and access to finance, moving toward an industry-wide consensus on how to value greener buildings could significantly impact calculations of returns on investment in energy efficiency finance projects.[xxv]

Another emerging tool is the use of energy savings insurance. For example, Energi Inc. now offers an "Energy Savings Warranty" intended to backstop savings guarantees provided by ESCOs or other energy efficiency contractors. Energi advertises that this warranty product allows contractors to remove the liability associated with providing an energy savings guarantee from their balance sheets. In projects that deploy novel energy efficiency technologies, lenders often require the use of insurance products to cover against technology defects until a track record is built. These insurance products are particularly useful to energy efficiency technology companies that are internally developing ESA or MESA business units seeking to expand the deployment of their technologies.

II. The Role of Public-Private Partnerships: Integrating Public and Private Financing

Figure 6



A. State-Level Policy

Innovation in the energy efficiency sector is occurring at both the state and federal levels. States have been increasingly aggressive in their adoption and utilization of energy efficiency programs, and many offer a range of incentives available to finance projects. As depicted in Figure 6 on the right, a plurality of states offer multiple financing mechanisms for energy efficiency, making these the most prevalent tools for supporting energy efficiency retrofits and supporting high-efficiency new build standards.[xxvi]

According to information collected by the National Association of State Energy Officials (NASEO), there are at least 66 different state loan funds in the U.S. and its territories. Some loan funds have been operating for years, while others were created with ARRA funding and capitalized through the Department of Energy's (DOE's) State Energy Program (SEP), which has leveraged $10.71 of state and private funding for every $1 of federal funding provided by DOE to state programs.[xxvii]

State-Level Case Studies

As of 2011, state-level loan programs were estimated to be reaching less than 2% of homes using existing loan structuring and outreach. Many states have demonstrated innovation since then in utilizing new mechanisms to attract private capital. Accordingly, many companies are reaping significant benefits in leveraging the very low interest rates of state-level debt and, in some cases, the ability to subordinate public capital to private debt. Pennsylvania (through its Keystone HELP program), for example, has approved the use of subordinated capital sourced through ARRA funds as part of the WHEEL structure. HELP has proven to be a viable financing program, as demonstrated by a 0.60% default rate program-wide. While default rates on loans to borrowers with FICO scores under 650 are high at 4.33%, these loans represent only 16% of the value of the HELP program's portfolio and they serve to demonstrate an important threshold for other state programs to build upon.[xxviii]

In 2012, California voters approved Proposition 39, a ballot initiative that closed a tax loophole and will use half of the proceeds (more than $2.5 billion over five years) to fund job-creating energy retrofits and clean energy installations at public schools and other public buildings and facilities, universities and colleges, workforce development, and public-private partnerships such as PACE. Also in 2012, Oklahoma implemented SB 1096, establishing the Oklahoma State Facilities Energy Conservation Program. The program, in conjunction with a variety of support structures, directs all state agencies and higher education institutions to reduce 20% from benchmarked energy usage by 2020, one of the states' most aggressive targets for implementation.[xxix] Programs such as these may encourage greater adoption of energy efficiency projects in a given state through top-down financial support and performance mandates.

The Connecticut Clean Energy Finance and Investment Authority (CEFIA) is notable as the nation's first full-scale clean energy bank. Established in 2012 with the passage of Public Act 11-80, CEFIA stands out among a suite of financing tools available to the Connecticut Department of Energy and Environmental Protection, including the Commercial Property Assess Clean Energy Program (C-PACE) to provide loan financing for commercial and industrial properties, a Special Capital Reserve Fund (SCRF) to issue bonds for programs that self-support from efficiency savings, a new electric conservation adjustment mechanism to allow the state to treat efficiency as a resource to be procured through customer rates at lower cost than generation resources, residential financing, community-scale block grants, and a strong focus on improving the efficiency of its building and operations. CEFIA itself was financed from surcharges on residential and commercial electric bills, Regional Greenhouse Gas Initiative auction allowance proceeds, and federal funding, and it intends to leverage private capital in conjunction with these funding sources for all initiatives.[xxx]

While many states offer ratepayer-funded energy efficiency programs, Connecticut's is unique for its mix of public and private capital, the array of incentives offered for efficiency projects, and the ability of the state to align the correct efficiency measure with the optimal source of capital to achieve implementation. As the Connecticut model proves viable, the Coalition for Green Capital, the nonprofit central to the formation of CEFIA, is currently replicating this model in over a half dozen other states.

The first state to build upon the Connecticut CEFIA is New York, as announced in Governor Andrew Cuomo's January 2013 State of the State Address. The proposed $1 billion Green Bank would create a fund to draw in private sector investment to match an array of funding sources spearheaded by New York, including funds from the state's Energy Efficiency Portfolio Standard, Renewable Portfolio Standard, and System Benefit Charge. While details since the announcement have been few, the financial strength and diversity of financing sources available to the Green Bank would make New York a leader in state-level energy efficiency finance and provide a valuable case study for demonstrating how to replicate the CEFIA.

In March 2013, CalCEF and Metrus Energy jointly launched the CalCEF Efficiency Resource Fund (CERF), as mentioned in Section I.B of this paper. Structured as a nonprofit, CERF is initially focused on providing financing for small- and medium-sized efficiency projects (~$1M or less) that would utilize Metrus' ESA, targeting the market of nearly two million owner-occupied commercial and industrial buildings in the U.S.[xxxi] CalCEF Ventures, a 501(c)(4) affiliate of CalCEF, intends to establish independent limited liability companies capitalized with impact investment funds to own the efficiency assets and deliver efficiency services, with Metrus to serve as the fund manager and project developer. This unique

pilot is the first of its kind, and CalCEF, in cooperation with Metrus, intends to test the CERF model in a pilot phase. [xxxii]

An interesting example of combining state-level capital with private capital using the MESA model is the $8.9 million CMAP program in Illinois. Several energy efficiency retrofit projects are under engineering study under this program, which combines SCIEnergy's MESA structure with a $3 million credit enhancement. This credit enhancement is anticipated to be leveraged to increase the amount of private lending for energy efficiency retrofits to the commercial building sector by providing a 10% loan loss reserve.

As states like Connecticut, California, and New York have stepped in to innovate financing options where the federal government has not been able to create a national standard, many states are adopting federal programs to fit their state needs. Similar to the federal Renewable Energy for America Program (REAP) funded by the U.S. Department of Agriculture, the Kentucky Agricultural Development Fund (ADF) offers up to a 50% rebate of a qualified energy savings measure on a quarterly basis.[xxxiii] REAP, one of the few remaining energy programs in USDA after the expiration of the Farm Bill, provides $20 million in either grants of up to 25% and guaranteed loans of up to 75% of eligible project costs, and has proven effective in introducing energy efficiency measures to a previously unaddressed market. By tailoring existing federal models to fit a given state's specific energy-intensive industries, agricultural producers are now benefiting from energy improvements that the industrial or commercial sector has led the way in implementing during the last several years.

State-level efforts to pair public investment capital with access to strategic networks are an increasingly common trend due to state-level familiarity with large-scale implementation post-ARRA funding, and the economic development potential in energy retrofits and efficiency improvements. There are also certain benefits to state-level financing for energy efficiency projects because loan and grant programs are typically processed more quickly than federal-level funding, creating new project pipelines or potentially filling a funding gap in an existing project. In addition, the funding landscape tends to evolve quickly. For example, some state revolving loan funds solicit new projects or investments as soon as funds become available, with less formally announced or scheduled requests for proposals. Opportunities are often channeled through economic development offices or state energy offices and, in some cases, through the state governor's office. Regardless of program origination, successfully weaving public capital into a private project requires a strategic dialogue with the state to understand its preferences and available investment tools. Delving into the local landscape and getting to know the state-level landscape can be tremendously valuable in capitalizing on what are sometimes fleeting windows of opportunity.

B. Federal Policy

In addition to evaluating sources of state-level financing for energy efficiency, various federal-level policies and initiatives are spurring both public projects and private markets. At the highest policy level, Executive Order (EO) 13423,[xxxiv] "Strengthening Federal Environmental, Energy, and Transportation Management," and EO 13514, "Federal Leadership in Environmental, Energy, and Economic Performance," [xxxv] collectively contain mandates that federal agencies measure, establish, and implement energy efficiency and renewable energy goals. EO 13423 requires federal facilities to reduce facility energy use per square foot by 3% annually, stemming back from 2006 through 2015, or 30% by the end of 2015. Under EO 13514,[xxxvi] energy efficiency and renewable energy goals were expanded and,

as was required, each agency has developed a Strategic Sustainability Performance Plan (SSPP) that defines specific targets and milestones for achieving its various energy objectives.

In August 2012, EO 13626, "Accelerating Investment in Industrial Energy Efficiency," was issued to provide guidance to federal agencies to encourage investment in efficient manufacturing processes and the adoption of combined heat and power systems by private industry. These orders serve as guideposts for the various performance goals the administration seeks to achieve through its tax policy, financing mechanisms, and cost-share funding programs.

Tax Policy

Of the array of tax provisions eligible regarding energy efficiency, the most applicable utilized by the Internal Revenue Service serve to lower the cost of installed energy efficiency measures at small-scale. Due to their size, many of these provisions are claimed by residential or commercial customers rather than tax equity investors, and can serve a secondary function of accelerating customer understanding and adoption of energy efficiency measures by directly linking the efficiency measure implemented to the cost savings received.

The federal government provides accelerated depreciation for certain energy efficiency property under Section 179D of the Internal Revenue Code. The Section 179D tax deduction is available for the installation of lighting systems, HVAC systems, hot water systems, and certain other building efficiency improvements that meet specified energy efficiency standards and that are installed prior to January 1, 2014, with the total amount available based on the square footage of building space. The accelerated depreciation benefit is modest in comparison to the energy credit available to renewable energy systems, but for certain building owners and/or tax equity investors who value accelerated depreciation, it does provide an additional financial incentive to justify energy efficiency projects.[xxxvii]

Three energy efficiency provisions of note were retroactively reinstated in the American Tax Payer Relief Act of 2012 to remain effective through December 31, 2013. The 25C Residential Energy Efficiency Tax Credit allows for eligible taxpayers to claim up to 10% of installed costs on qualified energy efficient retrofit improvements at a maximum of $500 per residence. The 45L Energy Efficient Home Credit offers $2,000 per dwelling unit for developers of energy efficient buildings and homes. The 45M Energy-Efficient Appliance Manufacturing Tax Credit provides variable credit amounts for select appliances.[xxxviii]

Department of Defense Financing Opportunities

On December 2, 2011, the President signed his Presidential Memorandum directing all federal agencies to enter into a minimum of $2 billion in performance-based contracts to meet EO 13514 energy reduction requirements, such as ESPCs and Utility Energy Savings Contracts (UESCs) over the next two years.[xxxix] The brunt of this goal fell on the Department of Defense (DoD), as DoD accounts for 80% of all federal energy usage. Facilities totaling 2.2 billion square feet comprise the 500,000 buildings and facilities in DoD's 500 permanent installations and forward operating base portfolio.[xl] Accordingly, the Office of the Secretary of Defense, the Armed Services (Army, Navy, and Air Force), the DoD-wide contracting agent Defense Logistics Agency – Energy (DLA-E), and base-level facility managers began the task of implementing $1.2 billion of the President's contracting goal through ESPCs and UESCs. Since each project financed under an ESPC and UESC must be cash-flow positive in its first year to qualify as an alternatively financed/performance-based contract, there are a variety of financing mechanisms for implementing energy efficiency improvements to defense installations that contractors can combine or utilize selectively to optimize private financing for a given project or aggregation of projects.

The first tier of projects relies on annual congressional appropriations to fund energy efficiency improvements for DoD facilities. The Sustainment, Restoration, and Modernization (SRM) line item awards competitive design-build, fixed-price contracts for projects typically less than $750,000. The annual SRM budget has more than doubled since 2008 to over $10 billion across DoD, and energy efficiency projects as even a small portion of total project funds provide an opportunity for companies seeking to help DoD maintain its aging infrastructure by reducing energy usage. The Energy Conservation and Investment Program (ECIP) provides $100 million to $200 million annually to dedicated energy savings measures across DoD. From 2012 to 2013, the annual portfolio of funded projects increased its savings-to-investment (SIR) ratio from 1.8 to 2.99, and many projects such as data center improvements or central heating and cooling upgrades reach SIRs of 8 or higher.[xli] DoD's increasing attention to its energy usage and subsequent energy costs provide an increasing market for companies able to work within federal contracting timelines and project requirements as the services seek to maintain their aging infrastructure.

The second tier is comprised of alternatively financed projects in DoD, primarily ESPCs and UESCs. The Office of the Secretary of Defense provided guidance for ESPCs utilized by DoD that typically range from $10 million to $25 million over a 25-year term with a GSA-approved ESCO, and notable projects include the $80.7 million ESPC for Tinker Air Force Base in 2012. UESCs typically range from $1 million to $2 million over a 10-year term with the providing utility, but projects for one of DoD's high priorities, central utility plant decentralization, reached $21.6 million for the Naval Support – Mechanicsburg UESC last year as well.[xlii]

As DoD seeks to meet the President's goals for increased ESPCs and UESCs from DoD, a provision that typically has not caused financeability issues is likely to bring cause for concern for both current contracts and future attempted ESPC and UESC contracts. Termination for convenience, the ability for DoD to cancel a project short of the contract terms, creates a liability for the base as it is required to pay the contractor a pro-rated amount based on the amount of time left in the contract. As DoD makes a congressional push for another round of Base Reassignment and Closure (BRAC) for FY 2015, bases seeking to implement long-term ESPC and UESC contracts could present financeability issues as a multitude of political, mission function, existing project liabilities, and legal factors play into which bases remain open and which are closed.[xliii]

The third tier of funded energy efficiency projects are classified as utilities privatization (UP) contracts. While UPs are considered alternatively financed projects and are subject to the same liability concerns as ESPCs and UESCs, their structure provides for unique avenues for energy efficiency product and service providers to tap the federal market. DoD owns over 2,600 utility systems valued at over $50 billion. Since the FY 1998 National Defense Authorization Act and DoD Reform Initiative Directive #9 authorized and directed DoD to privatize its array of electrical, gas, water, and wastewater systems, nearly 300 utility systems have been privatized. Typically contracted by DLA-E, these 50-year contracts allow bases to achieve dramatic energy savings on large-scale projects. Six bases have exceeded energy reduction goals by 20% in implementation, and Fort Belvoir represented a $261 million opportunity when contracted in 2006. While these measures are contracted to the utility, they offer an opportunity for the utility or other energy efficiency product or services providers to contract through the utility as opposed to the base, service contracting office, or DLA-E for projects.[xliv]

The UP structure enables energy efficient product providers to work with a financing entity that can accept longer paybacks. Energy service providers can implement projects with utilities that have a higher degree of familiarity with integrating more complex services. Moreover, UP contracts are "must-pay" items on the DoD budget, as opposed to SRM and ECIP measures, which can be delayed by congressional appropriations.

ESPC ENABLE

The Super ESPC program, reauthorized in 2008 by the Obama administration for the Federal Energy Management Program (FEMP) to administer and awarded to 16 ESCO firms, has been effective in providing the General Services Administration (GSA) with energy savings through new buildings and retrofitting existing facility capacity. Under the Deep Retrofit Challenge, announced in 2012, these ESCOs partnered with 30 of the largest buildings in GSA's 1,500 building fleet—over 17 million square feet of buildings—to provide ESPCs for a suite of energy savings technologies.[xlv] The Deep Retrofit Challenge highlights the difficulty in providing ESPCs for energy savings in smaller facilities. The soft costs of implementation, such as federal contracting timelines, aggregation of projects within and across sites, measurement and verification of energy savings, and education and integration of facility-level energy managers into top-down programs, have often proven to not justify underwriting to potential lenders. Federal contracting timelines can accordingly be months to years in execution, leaving a gap in projects requiring efficiency upgrades but no financing mechanism to leverage private capital.

Recently established by FEMP to address these issues, ESPC ENABLE provides a government-wide, standardized process for federal facilities smaller than 200,000 square feet to make the same efficiency and conservation improvements as the larger facilities addressed under the traditional ESPC structure. ESPC ENABLE still provides for a term of up to 25 years for which an ESCO designs, acquires, installs, and finances the energy efficiency measure, but projects focus on the $500,000 - $1,000,000 range rather than the traditional ESPC average of $14 million. An example ESPC project in this range with a 5-year term would be financed from the project value, plus 325 basis points over 10-year Treasury notes.

This program will accelerate the contracting timeline to 12-15 weeks, provide standard contracting templates for facilities, assist with measurement and verification assistance, and provide a suite of other tools to allow this traditionally underserved market to implement energy efficiency upgrades at contracting terms similar to Super ESPC, but the program will focus exclusively on low-hanging fruit upgrades such as lighting, water, and HVAC control systems.[xlvi]

Export and Investment Financing

In 2012, the Renewable Energy and Energy Efficiency Advisory Committee (RE&EEAC) was reauthorized under the administration's second term. In April 2013, a board was appointed, comprised of renewable energy and energy efficiency manufacturers and service providers, to support programs and policies expanding the competitiveness of U.S. exports. Acting as a central point for companies seeking to promote sales or contracts abroad, the RE&EEAC is housed in the Department of Commerce and utilizes financing programs from the Overseas Private Investment Corporation (OPIC), the Export-Import Bank of the United States (Ex-Im Bank), the U.S. Department of Agriculture (USDA), and the Small Business Administration (SBA).[xlvii]

Agencies offering incentives under RE&EE utilize a wide definition of energy efficiency that encompasses technologies and services across buildings, appliances, industry optimization, power generation, and smart grid. As the new advisory committee determines its agenda, priorities, and competitiveness issues,

these programs exist as available financing mechanisms and frameworks for the advisory committee to build up that companies can utilize in financing product sales and company expansions.

Ex-Im Bank provides a suite of products that allow it to mitigate financial risk between a domestic energy efficiency company and foreign lenders or buyers. These products include working capital facilities, loan guarantees, credit insurance, and project financing. Under the Environmental Exports Program, Ex-Im can also offer capitalized interest during construction and automatic availability for up to 30% local cost financing. For example, Boyle Energy Services & Technology, an independent commissioning services provider of energy optimization in new construction projects, grew its international sales 75% in over three years by utilizing Ex-Im short-term export-credit insurance. With exports now comprising 60% of the company's $15 million in sales, Boyle established customers in over 15 countries thanks to Ex-Im's financing support of its services.[xlviii]

Figure 7: Ex-Im Bank

Ex-Im Bank	
Title	Financial Support Description
Export Working Capital Program	Loan guarantees for transaction-specific working capital loans made by commercial lenders for export; utilized for purchasing finished products and paying for raw materials, supplies, and labor
Export Loan Guarantees	Loan guarantees covering 100% commercial and political risk; no limits on transaction size; available for equipment, software, banking/legal fees, local costs, and expenses
Direct Loan Program	Provides fixed-rate loans to creditworthy international buyers for purchases of U.S. goods and services
Credit Insurance	Provides small business, multi-buyer, and short-term single buyer competitive credit insurance policies
Limited Recourse Project Financing	Ex-Im can provide limited recourse project financing
Structured Finance	Ex-Im can consider existing foreign companies as potential borrowers based on their creditworthiness as determined by their balance sheet, other sources of collateral, or security enhancements

In addition to Ex-Im support, OPIC provides a suite of financing mechanisms for U.S.-based energy efficiency companies seeking to develop markets overseas. OPIC can provide direct loans, loan guarantees, and, most notably, political risk insurance for U.S. investors, operators, and lenders, which covers breach of contracts with foreign-government-owned entities such as utilities. Specific to energy efficiency, OPIC can provide subordinated debt to U.S.-owned companies for all loans, loan guarantees, and political risk insurance financings, and is able to lend to U.S. ESCOs or financial intermediaries assisting ESCOs to provide financing to downstream customers.

To be eligible for OPIC financing, applicants must have greater than 25% ownership based in the U.S. In previous energy efficiency investments, OPIC projects have primarily involved providing $50 million to $250 million in investment fund capitalization to an overseas, emerging market-based bank of which the sponsor is a shareholder. The local subsidiary will make smaller-scale investments in energy efficiency

projects in a portfolio of electricity generation, water, transmission, and transportation infrastructure improvements, and agricultural or industrial improvements.[xlix]

Figure 8: OPIC

OPIC	
Title	Financial Support Description
Project Finance Direct Loans	Provides medium- to long-term funding through direct loans to eligible investment projects in developing countries and emerging markets. OPIC lends at a fixed rate of up to $250 million per project.
Structured Finance Loan Guarantee	Provides medium- to long-term financing through loan guarantees for those projects in need of significant capital. Guarantees of up to $250 million per project are available to U.S. banks funding the project.
Political Risk Insurance	OPIC can cover up to $250 million per project for up to 20 years, with larger capacity through coinsurance and re-insurance with private-market carriers. Long-term losses can be deterred for tangible assets, value of investment, and earnings or return of the investment.
Equipment Leasing	Offers standardized loan structure to leasing companies seeking to arrange leases for energy efficiency equipment from U.S. vendors

Cost-Share and Early-Stage Programs for Energy Efficiency Research, Development, and Demonstration

Several earlier-stage demonstration programs administered by various government agencies provide energy efficiency companies the opportunity to demonstrate their new and innovative technologies utilizing cost-share from the government and existing federal assets as a testbed. These programs may also provide entry points for companies seeking to capture DoD or GSA as adopters and customers of their product.

The Operational Energy Capabilities Fund (OECIF) and the Environmental Security Technology Certification Program (ESTCP) each have annual budgets of over $10 million to provide in cost-share to demonstration projects.[l] While OECIF has funded projects that include innovative cooling equipment, energy efficiency shelter systems, and improved energy audits, ESTCP focuses on building envelope and energy management technologies.[li] Both programs help commercialize technologies that might not be able to obtain financing or demonstration capital for the initial product or service.

The energy reduction needs of the GSA face similar performance objectives that new efficiency technologies can help facilitate. GSA's Green Proving Grounds (GPG) solicits new technology areas annually since 2011, having completed assessment in the past two years for occupant responsive lighting, plug load control, and wireless sensor networks, and assesses their technical viability, project payback, and financeability for GSA facilities. Currently under review are building envelopes, HVAC/energy management, and lighting technologies. Once new technologies are evaluated for integration into GSA facilities, companies seeking to implement energy savings measures across the array of federal facilities will be able to participate through the GSA schedule.[lii]

Upcoming Legislation

While few of the energy efficiency bills introduced in the 112th Congress were implemented, the groundwork for bipartisan support for efficiency measures was laid and provisions that have a high likelihood of success in passing a divided House and Senate were identified. The Energy Savings and Industrial Competitiveness (ESIC) Act was introduced by Senators Jeanne Shaheen (D-NH) and Rob Portman (R-OH) in April 2013. Beyond establishing workforce training and building codes standards, ESIC would instate a Commercial Building Energy Efficiency Financing Initiative, designed to provide commercial PACE, credit enhancement, revolving loan, utility on-bill financing, and split-incentive leasing structure programs through grants administered to the states to utilize through this suite of mechanisms. $250 million would be made available for FY 2015 through FY 2020. Additionally, ESIC includes $5 million each for high-efficiency electric motor and energy efficiency transformer rebates. With controversial provisions from the 2011 bill funding state-level revolving loan programs and the DOE loan program and bipartisan champions in the House, this legislation stands a significantly higher likelihood of passage.[liii]

As mentioned earlier in Section 1, also introduced in 2011 and reintroduced this April is the MLP Parity Act, sponsored by Chris Coons (D-DE), Jerry Moran (R-KS), Lisa Murkowski (R-AK), and Debbie Stabenow (D-MI). Of particular note in the 2013 version is the inclusion of energy efficient buildings as eligible for master limited partnerships, with the variety of renewable generation seeking parity with the benefits currently enjoyed by the oil and gas industry.

Summary of Federal and State Energy Efficiency Mechanisms

While the programs and mechanisms discussed above cover a wide array of contracting and implementation structures, their effectiveness at supporting energy efficiency measures either for, financed by, or in conjunction with the federal government provides us with common themes to evaluate how industry can utilize such a complex network, as shown in Figure 9. As efforts to streamline these programs to combine supports where applicable, identify the most effective sources of government support, and increase the penetration of current efficiency measures progress, new valleys of death and financeability issues are sure to arise. Continuing to innovate and improve on energy efficiency finance models will encourage the industry to progress, the government to learn from effective programs, and the end energy users to realize greater energy savings and financial benefits throughout the economy.

Figure 9

Non-Exclusive Examples of Government Functions in Energy Efficiency Programs		
Government Function	**Federal**	**State**
Speeding End Customer Adoption and Market Pull	Executive Orders; DoD Congressional, Alternative, and Utilities; GSA Green Proving Grounds	Oklahoma SB 1096
Funding, Rebates, and Cost-Share of Projects	Tax Incentives; DoD Demonstrations; USDA Renewable Energy for America	CA Prop 39; Kentucky ADF
Lowering Cost of Available Capital	Ex-Im Bank; OPIC	Pennsylvania HELP
Facilitating New Sources of Capital	MLPs; REITs; ESPC ENABLE	Kentucky WHEEL; Connecticut CEFIA

III. Conclusion

Global economic growth is not sustainable without energy efficiency.

Even with the global revolution in shale gas and oil supply, this is one of the shared conclusions reached by many different energy experts across the energy spectrum.[liv] British Petroleum (BP), for example, in its current "Energy Outlook 2030" concludes that future global energy demands will be met only by the combination of both new supplies of shale gas, tight oil, renewable and other energy supplies, and energy efficiency gains. Relying on increasing energy (both fossil fuel and renewable) supplies alone will not suffice to meet the projected global increase in economic growth and demand. Indeed, BP projects that the amount of energy consumed per unit of GDP globally in 2030 is likely to be 31% lower than in 2011, and that without this projected decline, "the world would need to almost double the amount of energy supply by 2030 in order to sustain economic growth, rather than the 36% increase required in our Outlook."[lv]

In short, only through both energy efficiency gains and new energy supply are we likely to sustain projected global economic growth.[lvi] The imperative for energy efficiency, together with the need to improve energy security and boost economic competitiveness, all underline the importance of expanding opportunities for investors to enter the energy efficiency market at an increasing rate, and for more customers and project developers to perform retrofits and install energy efficiency technologies and improvements.

Improving the energy efficiency of our built environment continues to represent a $279 billion investment opportunity in the U.S. alone.[lvii] Increasingly, parties are developing solutions to the challenges and complex problems which still need to be overcome and opening pathways toward realizing the opportunities that energy efficiency finance presents to promote more sustainable economic development and growth, increase energy security, and improve economic competitiveness.

We see positive intermediate steps being taken in some market segments as emerging market leaders push forward with innovative solutions to energy efficiency finance, combining elements from different models such as the ESPC, ESA, MESA, commercial PACE, and OBR models with each other or with familiar financing techniques such as REITs and securitizations. Incremental progress in forming the essential building blocks for a broader energy efficiency finance framework is also being made, such as innovations in how upfront costs and subsequent energy savings are measured and verified; increasing understanding in the appraisal community about green appraisals and valuing energy efficiency improvements; insuring related risks; innovative applications of information and communication technologies to lower costs, aggregate and analyze data, and re-shape energy efficiency into a more dynamic, intelligent efficiency; reinvigorated interest among investors and local governments in commercial PACE; more advances in state legislation and regulation to encourage some forms of energy efficiency finance; uptake of the ESA and MESA financing structures; rare bipartisan political support for increased energy efficiency; and experimentation with increasing access to public capital markets and more investor classes at greater scales through innovative fund or partnership structures, REITs, or securitizations. Momentum continues to build.

"Those who are first on the battlefield and await the opponents are at ease; those who are last on the battlefield and head into battle get worn out."
– Sun Tzu, The Art of War

[i] C. Kim, B. O'Connor, K. Bodden, S. Hochman, W. Liang, S. Pauker, and S. Zimmermann, "Innovations and Opportunities in Energy Efficiency Finance," Wilson Sonsini Goodrich & Rosati, May 2012; *available at* http://www.wsgr.com/publications/PDFSearch/WSGR-EE-Finance-White-Paper.pdf.
[ii] *Available at* http://www1.eere.energy.gov/buildings/about.html.
[iii] "U.S. Building Energy Efficiency Retrofits," Rockefeller Foundation and DB Climate Change Advisors, March 2012.
[iv] Press release, "The U.S. Energy Service Company Market," Navigant Research, February 2, 2012.
[v] *Id.*
[vi] From the Prospectus dated April 17, 2013, filed by Hannon Armstrong Sustainable Infrastructure Capital, Inc., with the Securities and Exchange Commission, Registration No. 333-186711.
[vii] For an excellent review and discussion of the potential application of the REIT structure to finance renewable energy projects, see "Using REITs for Renewable Energy Projects," by P. Dowdall, TAX NOTES, December 24, 2012, p. 1409.
[viii] From the Prospectus dated April 17, 2013, filed by Hannon Armstrong Sustainable Infrastructure Capital, Inc., with the Securities and Exchange Commission, Registration No. 333-186711.
[ix] E. Birkerts and B. Hinkle, "The Sub-Million Dollar Question," CalCEF, March 2013.
[x] A recent example is the retrofit of 125 Maiden Lane in New York City, which was financed with a MESA provided by SCIenergy and credit enhancement from the New York City Energy Efficiency Corporation.
[xi] These estimates are based on project completion data provided to PACENow by program administrators and other sources, but has not been independently verified by PACENow.
[xii] The Database of State Incentives for Renewable Energy (DSIRE) website maintains a map showing states with PACE authority; *available at* http://www.dsireusa.org/documents/summarymaps/PACE_Financing_Map.pdf.
[xiii] This program was approved pursuant to Order No. 30974 of the Public Utilities Commission of the State of Hawaii on February 1, 2013, and is still under development.
[xiv] California Department of Corporations Release 60-FS, July 16, 2006; *available at* http://www.corp.ca.gov/Commissioner/Releases/60-FS.asp.
[xv] Most residential OBF programs have exhibited a participation rate of under 1% of all possible customers. As of January 2013, the highest observed participation rate for a residential program was 1.3%, for the Midwest Energy How$mart program. Harcourt Brown & Carey Energy & Financing, "On-Bill Financing in Hawaii: Prepared for the Hawaii Public Utilities Commission," January 4, 2013.
[xvi] U.S. Department of Energy, EECBG Program Notice 12-001, June 4, 2012; U.S. Department of Energy, State Energy Program Notice 12-002, June 4, 2012.
[xvii] If approved by the California Public Utilities Commission, the $24 million would be allocated to WHEEL and lending programs implemented by local banks, credit unions, and CDFIs. *See* Attachment to San Diego Gas & Electric Company (U902M) and Southern California Gas Company (U904G) Provision of Consultant Report on Energy Efficiency Finance Pilot Programs, October 19, 2012, at 15; *available at* http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M031/K735/31735747.PDF.
[xviii] Press release, "Solar State Just Got Sunnier: Mosaic Gets $100M Approval for Solar Investments to CA Residents; Releases New Clean Energy Abundance Video and Solar Project with Est. 4.5% Return," April 9, 2013; *available at* https://joinmosaic.com/blog/mosaic-gets-100m-approval-in-california.
[xix] *See, e.g.,* "Selling Guide Fannie Mae Single Family," May 2012, p. 562; *available at* https://www.efanniemae.com/sf/guides/ssg/sg/pdf/sel051512.pdf; S.K. Adomatis, "Describing the Green House Made Easy," *The Appraisal Journal,* Winter 2012, p. 29 (citing Uniform Standards of Professional Appraisal Practice Rule 1-1(e)).
[xx] V. Doyle and A. Bhargava, "The Role of Appraisals in Energy Efficiency Financing," May 2012, p. 8; *available at* http://www.nrel.gov/docs/fy12osti/54329.pdf.
[xxi] Residential Green and Energy Efficient Addendum (AI Reports® Form 820.03); *available at* http://www.appraisalinstitute.org/education/downloads/ai_82003_reslgreenenergyeffaddendum.pdf *and* http://www.appraisalinstitute.org/education/green_energy_addendum.aspx.
[xxii] The Green MLS Tool Kit, *Welcome to the Green MLS Tool Kit*; *available at* http://www.greenthemls.org/index.cfm.

[xxiii] S.K. Adomatis, "Describing the Green House Made Easy," *The Appraisal Journal,* Winter 2012, p. 22 (citing Uniform Standards of Professional Appraisal Practice Rule 1-1(e)); V. Doyle and A. Bhargava, "The Role of Appraisals in Energy Efficiency Financing," May 2012, pp. 17-18.
[xxiv] Information about the Appraisal Institute's "Valuation of Sustainable Buildings Professional Development Program" and other courses is available at http://www.appraisalinstitute.org/education/green_energy_addendum.aspx and http://www.appraisalinstitute.org/education/prof_dev_programs.aspx.
[xxv] D. Sheridan, "Financing for Green Building and Energy Efficiency Makes Incremental Gains," July 29, 2011.
[xxvi] "Financial Incentives for Energy Efficiency," Database of State Incentives for Renewables & Efficiency; *available at* http://www.dsireusa.org/summarytables/finee.cfm.
[xxvii] "U.S. State Energy Program"; *available at* https://www.naseo.org/data/sites/1/documents/publications/NASEO_SEP_In_Brief.pdf.
[xxviii] K. Palmer, M. Walls, and T. Gerarden, "Borrowing to Save Energy: An Assessment of Energy-Efficiency Financing Programs," Resources for the Future, April 2012; *available at* http://www.rff.org/RFF/Documents/RFF-Rpt-Palmeretal%20EEFinancing.pdf.
[xxix] Oklahoma Legislature Enrolled Senate Bill No. 1096, *available at* http://www.oklegislature.gov/cf_pdf/2011-12%20ENR/sb/sb1096%20enr.pdf.
[xxx] Clean Energy Finance and Investment Authority Comprehensive Plan FY 2013 through FY 2015, *available at* http://www.ctcleanenergy.com/Portals/0/FY13%20Comprehensive%20Plan.pdf.
[xxxi] E. Birkerts and B. Hinkle, "The Sub-Million Dollar Question," CalCEF, March 2013.
[xxxii] *Id.*
[xxxiii] Kentucky Agricultural Development Fund 2012 Program/Policy Revisions, *available at* http://agpolicy.ky.gov/funds/documents/2012_Guideline_Revisions_Summary.pdf.
[xxxiv] EO 13423 was issued in January 2007 and is available at http://www.gpo.gov/fdsys/pkg/FR-2007-01-26/pdf/07-374.pdf.
[xxxv] EO 13514 was established by President Obama in October 2009, with the directive that "Federal agencies shall increase energy efficiency; measure, report, and reduce their greenhouse gas emissions from direct and indirect activities; conserve and protect water resources through efficiency, reuse, and storm water management; eliminate waste, recycle, and prevent pollution; leverage agency acquisitions to foster markets for sustainable technologies and environmentally preferable materials, products, and services; design, construct, maintain, and operate high performance sustainable buildings in sustainable locations; strengthen the vitality and livability of the communities in which Federal facilities are located; and inform Federal employees about and involve them in the achievement of these goals."
[xxxvi] EO 13626 was issued in August 2012 and is available at http://www.whitehouse.gov/the-press-office/2012/08/30/executive-order-accelerating-investment-industrial-energy-efficiency.
[xxxvii] Internal Revenue Bulletin: 2012-2017, April 23, 2012; *available at* http://www.irs.gov/irb/2012-17_IRB/ar08.html
[xxxix] "Presidential Memorandum—Implementation of Energy Savings Projects and Performance-Based Contracting for Energy Savings," December 2, 2011; *available at* http://www.whitehouse.gov/the-press-office/2011/12/02/presidential-memorandum-implementation-energy-savings-projects-and-perfo.
[xl] "NREL Teams with Navy to Cut Energy Use," National Renewable Energy Laboratory, April 19, 2013; *available at* http://www.nrel.gov/news/features/feature_detail.cfm/feature_id=2178.
[xli] FY 2013 Energy Conservation Investment Program, Department of Defense Comptroller General.
[xlii] https://portal.navfac.navy.mil/portal/page/portal/navfac/navfac_ww_pp/navfac_navfaclant_pp/navfac%20atlantic%20industry%20forum%202012/lant%20bl%20brief_final_webpage.pdf.
[xliii] "Defense Infrastructure: Improved Guidance Needed for Estimating Alternatively Financed Project Liabilities," Government Accountability Office, April 2013.
[xliv] http://www.dla.mil/dla_media_center/Pages/newsarticle201207240300.aspx.
[xlv] http://www.gsa.gov/portal/content/129983.
[xlvi] https://www1.eere.energy.gov/femp/financing/espc_enable.html.
[xlvii] http://export.gov/reee/eg_main_023040.asp.

[xlviii] Export-Import Bank of the United States 2012 Annual Report.
[xlix] http://export.gov/reee/guide/eg_main_022140.asp.
[l] http://www.acq.osd.mil/osbp/docs/OECIF_energy_CallForProposalsFY12.pdf.
[li] http://www.serdp.org/About-SERDP-and-ESTCP/About-ESTCP.
[lii] http://www.gsa.gov/portal/category/102491?utm_source=PBS&utm_medium=print-radio&utm_term=greenprovingground&utm_campaign=shortcuts.
[liii] http://www.shaheen.senate.gov/imo/media/doc/Shaheen-Portman%20Introduced%20Version.pdf.
[liv] *See*, *e.g.*, the International Energy Agency's "World Energy Outlook 2012," British Petroleum's "BP Energy Outlook 2030," McKinsey Global Institute's "Urban world: Cities and the rise of the consuming class," and the U.S. National Intelligence Council's "Global Trends 2030: Alternative Worlds."
[lv] "BP Energy Outlook 2030," British Petroleum, January 2013.
[lvi] *Id.*
[lvii] "U.S. Building Energy Efficiency Retrofits," Rockefeller Foundation and DB Climate Change Advisors, March 2012.

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