Bridging the Gap
Expanding Capital Access for Commercial Energy Efficiency in Central Appalachia

PREPARED BY: Drew Pierson
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*Eric Stemen* - Mountain Valley (top); Mountain Town at Night (middle right); Mountain Town Intersection (bottom right)

*Wikipedia* - Electric Meter (middle right); High Efficiency Lightbulb (middle right)
About the MIT Wealth Creation Clinic

This report was prepared by the MIT Wealth Creation Clinic with final support by the Ford Foundation. The clinic, modeled after the Community Economic Development Legal Clinics established by the Ford Foundation in the 1970s, provides economic development and planning services to client partners working to apply a community wealth creation framework to rural economic and community development. The "transactional" model provides community-based development practitioners (clients) with access to the skills and knowledge of economic development practitioners working in business and commercial settings within academia (faculty and students) and provides a venue for training future practitioners. The Clinic is based on a pragmatic approach that emphasizes skill development (of both the student and client) and service provision in support of wealth creation and livelihood generation activities.

The Clinic is housed in MIT’s Department of Urban Studies and Planning (DUSP). Since its founding 80 years ago, DUSP has consistently been rated the premier planning school in the world. Home to the largest urban planning faculty in the United States and enjoying the advantage of operating within the context of MIT’s culture of innovation and interdisciplinary knowledge creation, DUSP applies advanced analysis and design to understand and solve pressing urban and environmental problems. To this end, the department fosters a culture of learning by doing, while also supporting the development of influential theories in the areas of urban planning and design; housing, community and economic development; and environmental policymaking.

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Executive Summary

This report discusses strategies to expand capital access for commercial energy efficiency projects in Central Appalachia. It draws on information and interviews with energy companies, lenders, and policy makers conducted in the summer of 2013, and investigates the nature of capital market gaps in the region's rural commercial building sector. Specifically, the report examines how the Mountain Association for Community Economic Development (MACED), a community development financial institution (CDFI) based in Eastern Kentucky, can encourage energy efficiency uptake in rural commercial buildings through positioning, lending products, and partnerships that address market barriers and help bring investments in rural energy efficiency to scale.

Energy efficiency has long been considered the “low-hanging-fruit” of the clean energy economy. Since basic utilities such as electricity, heating, and water represent a large operational expense for businesses and institutions, reducing energy use can confer a broad range of benefits. These include cost savings from lower energy bills; decreased pollution from lower electricity use; higher property values from better building performance and capital improvements; lower maintenance costs for facilities infrastructure; greater occupancy comfort; and more available revenue for payroll, working capital, and other business necessities. In rural areas, money saved through energy efficiency can provide an important lifeline for organizations facing tight budgets and an important source of jobs and economic development.

Traditional obstacles to rural development – such as declining rural populations and insufficient economies of scale - have locked many rural projects out of the conventional energy efficiency market. In the rural commercial building sector, barriers to energy efficiency are high given that business credit concerns and longer required payback periods often discourage small businesses, lenders and energy services companies (ESCOs) from investing in projects. Central Appalachia’s abundance of smaller, unserved rural commercial buildings underscores tendencies among many traditional energy contractors to avoid this market niche, and instead focus on more economically viable opportunities such as those in urban areas or the rural public and institutional sectors. In result, few energy contractors have amassed experience with rural commercial buildings in Central Appalachia and the sector is underdeveloped despite the robust growth of energy efficiency nationwide.

To accelerate energy efficiency uptake in Central Appalachia’s rural commercial buildings, MACED has dedicated effort toward designing and testing new commercial lending products that align with aspects of the ESCO model. An ESCO is a business that develops, installs, and arranges financing for energy efficiency projects, and is repaid in a number of ways, including through money saved on energy costs from efficiency improvements. A popular ESCO strategy, known as an “energy performance contract” (or an EPC), ties ESCO compensation directly to the performance of a project by designing monthly payments that are lower than anticipated energy savings. This motivates ESCOs to ensure that energy savings are achievable and verifiable, and to deploy a variety of integrated energy services that ensure on-going project performance. Some ESCOs also offer direct equipment purchase
or leasing agreements in lieu of or in addition to EPC services. In either case, ESCOs have amassed significant experience deploying EPC products in thousands of communities nationwide that are otherwise without access to energy efficiency services.

For MACED, Central Appalachia offers a strong impetus to expand aspects of the ESCO model. Compared to other regions of the U.S., Central Appalachia has higher rates of energy usage due to historically low electricity prices from coal-fired power and a widespread neglect of energy efficiency.\(^1\) Kentucky’s commercial building sector, for example, has a higher energy intensity per square foot than the national average,\(^2\) and a recent Appalachian Regional Commission (ARC) report projects that energy usage in the Appalachia will grow at a rate 50 percent higher than the national rate from now until 2030.\(^3,4,5\) Commercial buildings offer significant market potential in terms of square footage and energy use; yet see some of the lowest rates of market penetration compared to other sectors.\(^6\) This is significant, since Appalachia’s commercial building sector alone is projected to increase more rapidly in energy consumption than any other, with future increases ranging from 43-65\%.\(^7\)

Such high rates of energy usage – combined with energy price increases throughout Central Appalachia – pose significant economic risks as well as new business opportunities. In Kentucky, energy prices spiked nearly 40 percent from 2005-2010,\(^8\) and are projected to increase in future years due to a continuing decline of the Central Appalachian coal industry and tightening environmental regulations on fossil fueled power.\(^9\) These trends will negatively impact businesses that are sensitive to energy price fluctuations, and could detract from broader regional economic growth without significant investments in commercial energy efficiency.\(^10\) By championing lending products and project implementation strategies that lower barriers to rural energy efficiency investment, MACED can address these issues and support market development in the rural commercial building sector.

Upgrades to lighting fixtures and heating, ventilation, and air conditioning (HVAC) systems offer the first and perhaps most readily accessible investment opportunities in energy efficiency. Their comparatively short payback periods and positive returns on investment have drawn attention from traditional ESCOs nationwide;\(^11\) and could offer attractive paybacks in the rural commercial building sector. Lighting and HVAC systems comprise roughly 42\% of all commercial building energy use in Appalachia, and represent roughly 47\% of all projected savings to be achieved in the Appalachian commercial building sector alone through 2030.\(^12\) Together, lighting and HVAC offer an average of $5.90 in energy savings per dollar spent in Appalachia,\(^13\) suggesting a great deal of promise for this lending niche in the region. Other efficiency opportunities include building envelope upgrades, and loans and equipment leases for high-efficiency equipment such as those used for commercial food services, refrigeration, and waste heat recovery, among others.
Recommendations

To take advantage of these opportunities, MACED should pursue options related to (i) designing new financial products, (ii) utilizing credit enhancements, and (iii) strategically positioning the organization for market entry.

**New Financing Approaches:** Financing tools such as utility on-bill financing and property assessed clean energy (PACE) would allow businesses to forego assuming direct debt for equipment upgrades. Rather, businesses would pay back lenders through their standard utility bill (as with on-bill financing) or through additional taxes levied on the property (as with PACE). These tools would help lower investment risk for lenders, since both tie repayment obligations to elements of the building that are largely tenant-agnostic and legally-mandated for repayment in events of foreclosure (i.e. outstanding utility bills, taxes). MACED could also offer lease or lease-purchase contracts for equipment that retains its value over time and can be released, such as HVAC, LED and other lighting upgrades, motors and variable frequency drives, and building control and monitoring systems.

**Credit Enhancements:** Combining loans with credit enhancements such as interest rate buy-downs and loan loss reserves would help to lower the cost of financing for rural commercial loans, provide more security for lenders, and help raise additional sources of public and private capital pegged for specific uses such as rural development, small business financing, or energy efficiency. In turn, MACED would be in a better position to offer standardized loan terms with predictable, below-market interest rates and longer amortization periods; helping to move greater amounts of capital more quickly.

**Packaging lending products to address market segment needs:** On the deal level, traditional lenders and energy contractors tend to avoid small rural energy efficiency projects in part because of high transaction costs. To address this issue, MACED should focus on strategies that help improve economies of scale and lower the soft costs (e.g. legal, contracting, overhead etc.) associated with individual deals. First, MACED should aggregate multiple projects into single standardized contracts that meet minimum size and return thresholds. Second, it should segment the market to identify sectors with the greatest potential for energy savings (e.g. hospitality, assembly, food service, office, warehousing, etc.) and help improve the “market learning curve” for serving rural communities through repeated transactions. Third, it should partner with an ESCO or energy contractor focused on the rural commercial building sector, and pursue projects through a framework based on standardized contract language, mutual deal-term and project-specific criteria, and streamlined sourcing and approvals tools and processes. Fourth, MACED should work with local utilities to obtain customer energy use data, and apply energy benchmarking software to more efficiently source potential deals and determine the extent to which they align with market norms.

**Positioning products for new markets:** MACED should leverage its work with public utilities, economic development agencies and other lenders to impact public policy and regional program development to spur
growth in the commercial energy efficiency market. Starting with rural utility cooperatives that have participated in MACED’s How$mart residential on-bill financing program, MACED should assist private utilities with designing and implementing products tailored to commercial customers. MACED is uniquely positioned to help private utilities design and monitor commercial rebates, directly install projects, and implement energy efficiency programs because of its growing track record of energy efficiency project analysis and program implementation in other areas of its lending practice, such as with residential buildings. By drawing on its experience and deep understanding of rural-based lending, MACED can help increase the uptake of rural commercial energy efficiency in Central Appalachia, decrease demand on utility systems, and support job growth throughout the region.

MACED should also build a coalition of partners to advocate for state and federal policies that make it easier to raise private capital for rural commercial energy efficiency and help bring the market to scale. In Hawaii, for example, a recently passed law combines credit-enhanced bond financing and a dedicated utility surcharge with utility on-bill repayment to support loans for commercial energy efficiency and renewable energy projects. In Vermont and New York, similar state-level programs provide loan loss reserves for private lenders active in the commercial energy efficiency market. On the federal level, Private Activity Bonds (PABs) have been authorized by the Internal Revenue Service (IRS) as a means to raise low-cost private capital for traditional infrastructure projects and, in some cases, commercial and industrial capital improvements. PABs are a form of tax-exempt bond financing where a state or issuing authority pledges its general obligation support (i.e. its full faith and credit to the issuances of local governments or to a pooled bond credit) to credit enhance loans. While IRS code currently prevents PABs from broad application in the energy sector, supporters are beginning to advocate for federal policy changes that allow PAB’s to function as a clean energy financing tool.

Improving Deal Flow through Strategic Partnerships: Expanding the ESCO model in Central Appalachia will require the implementation of technical steps uniquely suited to energy efficiency contracting. These include deal prospecting and qualifying projects through energy auditing; designing, contracting, and building energy efficiency improvements; and projecting, testing, measuring, and verifying energy savings. MACED should position itself as a conduit and primary lender for specific stages of the ESCO value chain, and do so in ways that increase deal flow and build the market for rural commercial energy efficiency.

For example, establishing a letter of intent (LOI) process as a prerequisite for financing projects would help MACED create market precedents for technically screening and investing in energy efficiency opportunities. Energy contractors would see that projects meeting pre-established return and performance criteria have a greater likelihood of resulting in consummated deals, and in turn, be more likely to partner with MACED on a long-term basis to source, evaluate, and maintain projects. Research conducted for this report led to follow-on conversations between MACED and local energy contractors that would be open to implementing projects in this way; and MACED should dedicate attention to exploring this option further as a standard lending practice.

Additionally, MACED could draw on its experience in energy data analysis and program implementation to
design lending products that target ESCO work at specific stages of energy efficiency project development. For example, MACED could provide upfront financing for equipment and project construction, and utilize on-bill financing partnerships with local utilities to secure “lender precedent” over cash flows resulting from the energy savings guaranteed by partnering ESCOs. In this way, MACED can maintain control over cash flows (i) needed to amortize its loans and (ii) pay ESCOs for performing the work. Doing so would also allow MACED to secure its financial interests in case disputes arise over whether projects were properly implemented by energy contractors, and assuage the concerns of partnering lenders that are solicited to provide additional capital for rural commercial energy efficiency projects.

Lastly, pursuing partnerships with established capital access programs on the state, federal, and national CDFI levels could help MACED facilitate greater access to low-cost financing for commercial energy efficiency projects in Central Appalachia. The United States Department of Agriculture (USDA) Business & Industry Loan Guarantee Program, for example, guarantees bank loans made to rural businesses for capital improvements, including energy efficiency and clean energy projects. The Kentucky Small Business Credit Initiative (SBCI) also helps raise public and private capital to finance creditworthy businesses that fall outside of normal underwriting standards. The National Development Council’s “Grow America Fund” (GAF) also bridges Small Business Administration loan guarantee programs with its own as well as institution investor capital to provide community development loans to underserved areas. In sum, MACED could work to either leverage or emulate aspects of these programs to provide credit enhancements for rural commercial energy efficiency loans.
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Introduction

This report outlines strategies to expand capital access for commercial energy efficiency projects in rural Appalachia. As community development financial institutions (CDFIs) increasingly look to energy efficiency as a potential lending opportunity, the need to bridge energy efficiency market norms and rural development challenges with innovative financing solutions becomes apparent. Traditional obstacles to rural development – such as declining rural populations and insufficient economies of scale – have locked many rural communities out of the conventional energy efficiency market. This is especially noteworthy in the rural commercial business sector, where credit concerns among small businesses and longer required payback periods for projects create barriers to energy efficiency investment. Despite the robust growth of energy efficiency nationwide, rural-based energy efficiency continues to lag behind.

Energy efficiency has long been considered the “low-hanging-fruit” of the clean energy economy. Since basic utilities such as electricity, heating, and water represent a large operational expense for businesses and institutions, reducing energy use can confer a broad range of benefits, including cost savings from lower energy bills; decreased pollution from lower electricity use; higher property values from better building performance and capital improvements; lower maintenance costs for facilities infrastructure; higher occupancy comfort; and more available revenue for payroll, working capital, and other necessities. In rural areas, money saved through energy efficiency can provide an important lifeline for organizations facing tight budgets and an important source of economic development.

The Mountain Association for Community Economic Development (MACED) is a CDFI in eastern Kentucky working to build a new energy value chain in Central Appalachia. MACED is helping to advance rural economic prosperity by extending energy efficiency-focused lending products and services to under-served market segments, including the rural commercial building sector. While MACED has made some progress toward addressing the needs of this market niche, it is in the early stages of implementing commercial energy efficiency lending products and seeking new opportunities to expand. MACED’s long-term goal is to create a scalable regional investment strategy that can address market gaps in Central Appalachia’s rural commercial energy efficiency sector, and support smaller projects that have been shut out of the traditional energy efficiency market.

MACED is interested in identifying aspects of the energy services company (ESCO) business model that can help it expand its existing energy efficiency programs and build capacity to address barriers to commercial energy efficiency investment. An ESCO is a business that develops, installs, and arranges financing for commercial energy efficiency projects, and is repaid in a number of ways, including through money saved on energy costs from efficiency improvements. Since their inception during the 1970’s, ESCOs have served thousands of communities otherwise without access to financing or comprehensive energy solutions. While ESCO activities have grown nationwide, they have largely focused on denser urban areas because of favorable economies of scale. Larger
ESCOs tend to overlook smaller municipalities and projects since they frequently require minimum investment thresholds to be profitable; which has left many rural areas underserved.

This report is designed to help MACED better understand aspects of the ESCO model, and strategies to expand it into rural areas through supportive lending products. Specifically, the report will:

1. Provide an overview of the ESCO model based on a review of the academic, policy, and industry literature.
2. Outline current challenges for rural-based energy efficiency in Central Appalachia.
3. Provide case studies of successful energy efficiency and clean energy financing strategies and programs applicable to a rural context.
4. Provide an overview MACED’s existing capabilities, and an analysis of which elements of the ESCO model would best align with its existing toolset.
5. Recommend strategies to integrate aspects of the ESCO model into MACED’s current work and scale regional investments in rural energy efficiency.
1.0 Overview of the ESCO Model

Energy services companies (ESCOs) have grown in popularity as a way to generate energy and economic savings in the built environment. They have several definitions:

The Pacific Northwest National Laboratory defines an ESCO as:

“A company that identifies energy improvements, provides capital required to install improvements, offers turnkey installation services, and guarantees energy savings” 23

The U.S. Department of Energy defines an ESCO as:

“A company that provides energy efficiency-related and other value-added services for which performance contracting is a core part of its energy-efficiency services business” 24

The National Association of Energy Services Companies (NAESCO) defines an ESCO as:

“A business that develops installs, and arranges financing for projects designed to improve the energy efficiency and maintenance costs for facilities over a seven to twenty year time period” 25

In short, ESCO’s are energy project developers that combine engineering expertise with business savvy to extract untapped efficiency potential for clients otherwise without capacity to perform the work in house.

1.1 Typical ESCO Services

ESCOs offer a broad range of integrated services to help lower barriers to entry for energy efficiency and clean energy projects. Core ESCO services typically include:26

- Energy audits
- Project scope development
- Engineering & design
- Financing
- Equipment selection & purchasing
- Construction management

- Project documentation
- Training owner’s operating staff
- Ongoing monitoring & verification activities
- Commissioning, Operations & Maintenance
- Utility power negotiations & purchasing
- Facilities management services
As a result of energy servicing, companies pay the ESCO back over a period of years from the energy cost savings generated from the project. In turn, ESCO’s monitor the performance of a project for the life of the contract and verify the energy savings that result. In some cases, ESCO’s may also elect to provide, operate and maintain the equipment, and/or back contracts with a performance guarantee; which guarantee that a specified level of energy and/or dollar savings will be created, and that the ESCO’s compensation will be directly linked in some way to project performance.27

1.2 ESCO Project Types

A 2010 study by the Lawrence Berkeley National Laboratory outlines major project types that characterize the national U.S. ESCO industry. In 2011, Energy Efficiency comprised nearly three quarters of ESCO industry revenues (74.5%), followed by onsite generation technologies (i.e. Renewables + Engine/Turbine, at 8.7%), Operations and Maintenance (O&M) Contracts (4.8%), Utility Program implementation (3.4%), Consulting (3.2%), and Commissioning (3.1%).29

1.3 Types of ESCOs

ESCO’s differ in their ownership structure and in the markets they serve. According to Baechler and Webster (2011), ESCO’s can be independent or affiliated with other companies, such as equipment suppliers, utility company subsidies and rebates, or engineering companies. Their market focus may be dictated by local geography, or they may prefer to work on the national or international scale.30 “Market-focused” ESCO’s may work in specific sectors (e.g. commercial, industrial, residential, schools, hospitals, government) and/or concentrate on one or more technical areas including lighting, HVAC, controls, or industrial processes.31
1.4 ESCO Customer Segments

Traditionally, ESCO’s have focused largely on public sector and institutional clients. These include (i) federal facilities, and (ii) state/local governments, universities/colleges, K-12 schools, and health care facilities (i.e. the “MUSH” market). A 2013 study by the Lawrence Berkeley National Laboratory outlines key drivers behind this trend, and summarizes ESCO industry revenue in 2011 by customer segment.

<table>
<thead>
<tr>
<th>Key ESCO Customer Segment Trends (2011)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 84% of ESCO revenues came from public and institutional sector clients, including the federal government.</td>
</tr>
<tr>
<td>• Federal, state, and local government energy use reduction goals drove the use of energy performance contracts on large projects that were authorized to have terms up to 20 years.</td>
</tr>
<tr>
<td>• State and local government, federal government, and K-12 schools projects were the three largest sources of revenue for ESCOs, accounting for 24%, 21%, and 19% shares respectively.</td>
</tr>
<tr>
<td>• Barriers to comprehensive energy improvements in private commercial and industrial (C&amp;I) facilities remained high, as private sector projects only accounted for 8% of ESCO industry revenues in 2011.</td>
</tr>
<tr>
<td>• ESCOs reported that private sector companies in the U.S. are generally averse to financing energy efficiency work, as well as to allocating capital expenditures for energy projects that have relatively long payback periods.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 1: ESCO Industry Revenue By Customer Segment (2011)</th>
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</thead>
<tbody>
<tr>
<td><strong>Market Segment</strong></td>
</tr>
<tr>
<td>State/Local</td>
</tr>
<tr>
<td>Federal</td>
</tr>
<tr>
<td>K-12 Schools</td>
</tr>
<tr>
<td>University / College</td>
</tr>
<tr>
<td>Commercial &amp; Industrial</td>
</tr>
<tr>
<td>Health / Hospital</td>
</tr>
</tbody>
</table>
### Table 1: ESCO Industry Revenue By Customer Segment (2011)

<table>
<thead>
<tr>
<th>Segment</th>
<th>Share</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Housing</td>
<td>4.2%</td>
<td>$217</td>
</tr>
<tr>
<td>Other</td>
<td>3.3%</td>
<td>$168</td>
</tr>
<tr>
<td>Total</td>
<td>100.0%</td>
<td>$5,138</td>
</tr>
</tbody>
</table>

### 1.5 Type of ESCO Business Activity

Performance-based contracting (EPC's) has been the dominant contracting vehicle for the ESCO industry, accounting for 69% of revenues (i.e. about $3 billion) in 2011.\(^{35}\) Design/Build projects comprised the next largest share of 2011 revenue (at 15%), followed by Utility Program Administration (7%), Consulting (3.9%), and Onsite Generation Power Purchase Agreements (3.6%).\(^{36}\) These shares are outlined in Figure 2.

![Figure 2](Image Source: LBNL, 2010)

### 1.6 Estimated ESCO Market Size and Market Penetration

In a 2013 study of total ESCO market potential, the Lawrence Berkeley National Laboratory observes that private commercial buildings offer the market one of the largest shares of square footage of ESCO-addressable buildings, at 33.6% of Total Floor Area nationwide.\(^{37}\)
Despite its size, however, the “private commercial building” sector was also found to represent one of the smallest sources of ESCO revenue in 2011, at only 8% of total industry revenue. Barriers to implementing ESCO services in this sector remain high since private commercial businesses often require payback periods much too short for project economics to bear. This trend persisted throughout the last decade, as private commercial buildings saw some of the lowest market penetration rates of any sector nationwide from 2003-2012.
<table>
<thead>
<tr>
<th>Market Segment</th>
<th>U.S. Census Region</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Northeast</td>
</tr>
<tr>
<td>K-12 Schools</td>
<td>45%</td>
</tr>
<tr>
<td>State/Local</td>
<td>39%</td>
</tr>
<tr>
<td>Federal</td>
<td>27%</td>
</tr>
<tr>
<td>Universities/Colleges</td>
<td>25%</td>
</tr>
<tr>
<td>Public Housing</td>
<td>20%</td>
</tr>
<tr>
<td>Health/Hospitals</td>
<td>10%</td>
</tr>
<tr>
<td>Private Commercial</td>
<td>10%</td>
</tr>
</tbody>
</table>

The 2013 Lawrence Berkeley National Laboratory study interviewed sixteen (16) ESCOs that served private commercial customers nationwide. It found that private commercial customers were cited to be generally averse to financing energy efficiency work, and to allocating capital expenditures for energy projects that had relatively long payback periods. One ESCO in the study – whose primary customer segment was private commercial businesses – reported that most of its customers were publicly-held companies that only demonstrated interest in projects with extremely short payback times (1-2 years).
1.7 Measures Installed in ESCO Projects

According to the Lawrence Berkeley National Laboratory (2011), lighting fixtures and heating, ventilation, and air conditioning (HVAC) systems are the most commonly installed energy efficiency measures in ESCO projects.

Image Source: Lawrence Berkeley National Laboratory (2011)
# 1.8 Types of Performance Contracts

Performance contracts form the legal framework between an ESCO and the customer. These relationships often span multiple years and typically include energy management services and other capital upgrades to facilities. Performance contracts come in multiple forms: Guaranteed Savings, No Guaranteed Savings, and Utility Purchase Agreements (also known as “chauffage” agreements).

<table>
<thead>
<tr>
<th>EPC Contract Type</th>
<th>Guaranteed Savings</th>
<th>No Guaranteed Savings</th>
<th>“Chauffage,” or Utility Purchase Agreements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guaranteed Savings</td>
<td>Guaranteed savings contracts are the most common form of performance-based contracts, and most heavily used by the government. These contracts are characterized by:</td>
<td>The ESCO provides an energy audit, design, construction management, and commissioning, usually at a fixed fee, but does not guarantee the energy savings or performance of a project:</td>
<td>“Chauffage” is a French word meaning “heating” and is used to describe an arrangement popular with ESCOs in Europe and U.S.</td>
</tr>
<tr>
<td></td>
<td>• A fixed term with a fixed payment schedule in which the ESCO ensures the savings will meet or exceed a minimum level</td>
<td></td>
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<tr>
<td></td>
<td>• Financing typically produced or facilitated by the ESCO, but may also include capital from the owner</td>
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</tr>
<tr>
<td></td>
<td>• ESCO sees no added benefit if savings estimates are exceeded</td>
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<tr>
<td></td>
<td>• In this case, owner accepts all of the project risk, similar to a design/build arrangement</td>
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<tr>
<td></td>
<td>• The owner may provide capital directly from cash reserves or financing</td>
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<tr>
<td></td>
<td>• In this arrangement, the ESCO owns, operates, and maintains the energy equipment</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The owner buys the end-use (heating, air-conditioning, lighting, etc.) for an agreed-upon rate and period of time</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The ESCO negotiates with fuel and power suppliers to arrange purchase arrangements, and maintains those relationships</td>
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<td></td>
</tr>
</tbody>
</table>
1.9 Financing Strategies For Energy Performance Contracts

Since a wide variety of payback periods often characterize energy efficiency projects, different financing strategies should be used depending on the client and project type. These can be generally grouped under (i) Lease and (ii) Direct Equipment Purchase agreements.

<table>
<thead>
<tr>
<th>Category</th>
<th>Options</th>
<th>EPC Applicability</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lease Agreements</strong></td>
<td>Operating Leases</td>
<td>√</td>
</tr>
<tr>
<td></td>
<td>Capital Leases</td>
<td>√</td>
</tr>
<tr>
<td></td>
<td>Tax-Exempt Leases</td>
<td>√</td>
</tr>
<tr>
<td><strong>Direct Equipment Purchases</strong></td>
<td>Internal Cash</td>
<td>√</td>
</tr>
<tr>
<td></td>
<td>Term Loans</td>
<td>√</td>
</tr>
<tr>
<td></td>
<td>Tax-Exempt Loans</td>
<td>√</td>
</tr>
<tr>
<td></td>
<td>On-bill financing</td>
<td>√</td>
</tr>
<tr>
<td></td>
<td>Property Assessed Clean Energy</td>
<td>√</td>
</tr>
</tbody>
</table>

**Lease Agreements**

Leases are contracts between two parties where the lessee agrees to pay the lessor for the use of energy assets. They can be flexibly structured according to fee schedules, contract terms, renewal conditions, termination options, asset maintenance, and a variety of other factors. There are three general benefits for using a lease:

1. First, lease rates are often lower than loan rates and are less risky for entities without an appetite to assume additional debt.

2. Second, if the leased equipment has a significant resale value and will likely be replaced at the end of the term, then lease payments can be structured to simply finance the difference between the equipment cost and residual value; not the full equipment cost.

3. Third, if lease payments are greater than the sum of interest payments and depreciation under a direct purchase with debt option, then the company will gain tax benefits under the leasing option.
Leases generally come in three forms: Operating Leases, Capital Leases, and Tax-Exempt Leases.

**Operating Leases** are those in which the lessor transfers equipment usage rights to the lessee for the term of the lease.\(^5^2\) There is no transfer of ownership or option to purchase the asset at a reduced rate at the end of the contract.\(^5^3\) This does not affect an ESCO client’s balance sheet because the lease is treated as an operating expense.\(^5^4\) Operating leases, however, are expected to phase out in the near term as U.S. GAAP accounting rules converge with International Financial Reporting Standards.\(^5^5\)

**Capital Leases** are on-balance sheet expenses that are treated as a capital expense.\(^5^6\) There is flexibility in assigning payments, which often can be scheduled to coincide with savings from energy efficiency projects.\(^5^7\) The lessee often also has the option of purchasing the equipment at the end of the lease for a price below market value.\(^5^8\)

**Tax-Exempt Lease-Purchase (TELP) agreements** are unique leasing arrangements only available to tax-exempt organizations, such as government, educational, and not-for-profit entities.\(^5^9\) Sometimes referred to as a “municipal” or “abatement” lease, TELP agreements have lower rates than conventional financing for commercial entities because the interest paid to the lessor is not subject to federal taxes.\(^6^0\) They are structured so that the full cost of the project is amortized over the lease period, with a nominal purchase option included at the end of the contract.\(^6^1\)

**Direct Equipment Purchases**

Direct equipment purchases are warranted in a variety of energy efficiency scenarios, such as (i) when efficiency projects have fast enough payback periods that clients feel comfortable with assuming debt directly, (ii) when ESCO’s are averse to offering longer contracts, (iii) when ESCOs would prefer to offload project performance risk to the customer, or (iv) when equipment lease agreements offer a purchase option at the end of the term. Direct equipment purchases are typically made through internal capital (i.e. cash of an organization’s balance sheet) or loans. Two types of loans are most often used: Term Loans and Tax-Exempt Loans.

**Term Loans** offered by commercial banks are the most common financing solution and frequently used for private sector entities, and can be tailored to the size and scope of an organization’s needs.\(^6^2\) Term loans may be secured or unsecured, and reflect an interest rate based on the lender’s cost of funds, the federal funds rate, the LIBOR (London Interbank Offered Rate), or the bank Prime Rate.\(^6^3\)

**Tax-Exempt Loans** offer an additional option for qualifying entities. Similar to tax-exempt leases, tax-exempt loans are loans to entities and for purposes that qualify for tax-exempt financing under IRS rules. The result is that lessees can qualify for lower interest rates because lessor does not have to pay taxes on the interest earned.
Additionally, customers can lessen risk exposure for direct equipment purchases in instances where financing is used through repayment methods that link repayment to the property itself rather than the current owner or occupant. Two popular methods for doing so include On-Bill Financing and Property Assessed Clean Energy (PACE) financing.

On-Bill Financing enables building owners to make energy efficiency upgrades without assuming direct project financing risk. In this case, an ESCO facilitates financing with a third-party lender and charges the building owner a fee to implement energy projects and deliver savings on the owner’s utility bill. Loan payments are then made through an allocation on the owner’s utility bill, which has the effect of transforming energy upgrades from a capital expense to an operating expense.

Property Assessed Clean Energy (PACE) financing enables building owners to withdraw loans for energy upgrades and pay them back through an assessment on their property, often collected through additions to the property’s tax bill. Similar to on-bill financing, ESCO’s can facilitate financing with a third-party lender and charge building owners a fee to implement energy projects and deliver savings on their utility bill.

### 1.10 Financing Sources For Energy Performance Contracts

The Lawrence Berkeley National Laboratory (2013) observes that fifty percent (50%) of private commercial customers for ESCOs used cash to pay for their projects, and 16% used other types of financing, such as Efficiency Services Agreements (ESA).

An ESA is similar to a power purchase agreement, in that a third party provides capital for the project and takes ownership in the energy conservation measures for the length of the contract.⁶⁴ The third party contracts with an ESCO (or other energy service provider) to develop the efficiency project and provide long-term maintenance.⁶⁵ The third party also contracts directly with the building owner, who pays for the project at a specified price per unit of energy and operational cost savings.⁶⁶ This structure enables energy efficiency to be treated as a “service” off the balance sheet rather than debt. ⁶⁷
<table>
<thead>
<tr>
<th>Market Segment</th>
<th>Cash</th>
<th>Partial Cash</th>
<th>Term Loan</th>
<th>State/Local Bond</th>
<th>Lease</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal Gov’t (n=9)</td>
<td>40%</td>
<td>7%</td>
<td>0%</td>
<td>3%</td>
<td>19%</td>
<td>31%</td>
<td>100%</td>
</tr>
<tr>
<td>State &amp; Local Gov’t (n=24)</td>
<td>15%</td>
<td>14%</td>
<td>16%</td>
<td>31%</td>
<td>23%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>K-12 Schools (n=25)</td>
<td>7%</td>
<td>8%</td>
<td>18%</td>
<td>34%</td>
<td>28%</td>
<td>5%</td>
<td>100%</td>
</tr>
<tr>
<td>Universities &amp; Colleges (n=23)</td>
<td>20%</td>
<td>16%</td>
<td>22%</td>
<td>22%</td>
<td>19%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>Health &amp; Hospital Facilities (n=16)</td>
<td>33%</td>
<td>16%</td>
<td>28%</td>
<td>1%</td>
<td>21%</td>
<td>1%</td>
<td>100%</td>
</tr>
<tr>
<td>Public Housing (n=6)</td>
<td>17%</td>
<td>3%</td>
<td>5%</td>
<td>4%</td>
<td>58%</td>
<td>13%</td>
<td>100%</td>
</tr>
<tr>
<td>Commercial &amp; Industrial (n=16)</td>
<td>50%</td>
<td>4%</td>
<td>23%</td>
<td>2%</td>
<td>5%</td>
<td>16%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Twenty-seven (27) ESCOs surveyed in the 2013 Lawrence Berkeley National Laboratory study reported that some portion of their projects used utility customer-funded financial incentives, such as rebates, no-cost or subsidized audits, engineering studies, and technical assistance. Among these respondents, eighteen (18) were smaller ESCOs (i.e. annual revenue <$100 million) who reported that, in aggregate, over 80% of their projects utilized utility incentives. In contrast, the larger ESCOs surveyed reported that utility incentives for energy efficiency offset a very small percentage of the total project cost for their larger projects. These findings suggest that utility incentives may be particularly important to the economics of projects typically implemented by smaller ESCOs.68
1.11 Cash Flow Options for Energy Performance Contracts

When realized energy savings are less than what is contractually guaranteed by an EPC, ESCOs typically repay their customers commensurate to the energy savings shortfall. Depending on the ESCO, EPC cash flows are arranged in one of two ways: 69

**Cash Flow Option 1: Separate Customer Payments to the Utility and EPC Provider/Lender**

- Step 1. Pay (reduced) utility bill per usual
- Step 2a. Direct customer payment to ESCO through EPC based on energy savings realized, who then pays the lender
- Step 2b. Alternatively, customers pay directly to the lender, who then pays ESCO based on energy savings realized and verification that work was completed
- Step 3. ESCO reimburses customer for shortfalls in contracted energy savings

**Cash Flow Option 2: One Payment to the EPC Provider**

- Step 1. One Payment
- Step 2. Debt Service
- Step 3. Utility Bill
- Step 4. ESCO reimburses customer for shortfalls in contracted energy savings
1.12 Growth Prospects in the ESCO Industry

The 2013 Lawrence Berkeley National Laboratory study\textsuperscript{70} observed that while the ESCO industry experienced significant growth over the last decade, it did not grow as fast as initially projected. Contributing factors are listed below:

<table>
<thead>
<tr>
<th>Growth Factors:</th>
<th>Curtailment Factors:</th>
</tr>
</thead>
<tbody>
<tr>
<td>From 1990-2011, the ESCO industry in the U.S. grew more than twenty fold – from approximately $250 million in revenues to $5.3 billion.\textsuperscript{71} It grew about 7% per year from 2006 to 2008 despite the Recession, and 26% per year from 2009 to 2011.\textsuperscript{72} Key drivers behind this growth included:</td>
<td>Key drivers behind curtailment in industry growth included:</td>
</tr>
<tr>
<td>• A large infusion of funding from the AmericanRecoveryandReinvestment Act (ARRA) to support state and local government energy efficiency programs.</td>
<td>• Impacts of the 2008 Recession created flat or declining economic growth in sectors traditionally targeted by ESCOs. The result was curtailed spending on capital improvements such as energy retrofits and building expansions.</td>
</tr>
<tr>
<td>• Increased spending in ratepayer-funded energy efficiency programs.</td>
<td>• National credit markets tightened in response to the 2008 Recession, making it difficult for ESCO customers to secure third party financing. Many financial institutions shortened the contract terms they were willing to finance, which had the effect of reducing overall project investment size.</td>
</tr>
<tr>
<td>• Increased customer interest in strategies that mitigate higher utility bills and/or address environmental concerns.</td>
<td>• The ESCO industry consolidated significantly through buyouts and mergers post 2008, which temporarily curtailed growth prospects as companies reconfigured their business strategies and absorbed companies with different business models.</td>
</tr>
</tbody>
</table>
2.0 Energy Efficiency in a Rural Development Context

This section discusses challenges and opportunities related to scaling energy efficiency lending for rural commercial businesses in Central Appalachia. It starts by covering challenges in rural development and rural capital markets in the region. It then outlines observed energy efficiency market trends, gaps, and opportunities based on interviews with area ESCOs, energy contractors, lenders, and community leaders.

<table>
<thead>
<tr>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dilemma:</strong> The growth of energy efficiency in the Central Appalachian rural commercial business segment has been curtailed two fronts: (i) rural capital market trends that have tightened the supply of debt available to small businesses in rural areas, thereby discouraging capital investment; and (ii) structural market conditions and diseconomies of scale that characterize rural commercial energy efficiency projects.</td>
</tr>
<tr>
<td><strong>Solutions:</strong> Scaling commercial energy efficiency in Central Appalachia will require a regionally focused, collaborative approach that (i) draws from multiple sources of patient capital, (ii) enhances the security of energy efficiency projects through credit enhancements, utility partnerships, and other solutions to reduce financial and performance risk, and (iii) innovative contract and project delivery methods that aggregate multiple deals while reducing overall transaction costs.</td>
</tr>
</tbody>
</table>

2.1 Challenges in Rural Development

While energy efficiency presents a significant economic opportunity for Central Appalachia, the structural characteristics of its largely rural communities pose obstacles that have historically hindered market development. Communities in the region are largely isolated, and generally lack sufficient population density, infrastructure, and scale to support private investment.\(^{73}\) Population decline has also put negative pressure on financially strapped governments and businesses, who face a constant need to uncover new revenue in light of dwindling tax bases, declining customers, and changes in local economies.\(^{74}\) Human and financial capital also tends to be limited in the region, and fewer basic institutions make up the ecology of rural development investment.\(^{75}\) Because of these
challenges, rural development practitioners in Central Appalachia often assume multiple roles to make up for the
general lack of supporting institutions and an increasingly scarce pool of resources. As such, rural developers
tend to be less likely to operate in specialized niches focused solely on financial transactions; but rather, are likely
to favor comprehensive development approaches oriented towards partnerships and regional collaboration. For
MACED, these issues underscore the importance of endorsing interdisciplinary, collaborative approaches that
help build the market for rural commercial energy efficiency in Central Appalachia.

2.2 Challenges in Rural Capital Markets

The development finance ecosystem in rural areas has evolved significantly over the last twenty years in
tandem with changes in rural development practice. According to the Rural Policy Research Institute (2012),
businesses seeking capital have had two primary options: (i) personal resources, including those of family and
friends, or (ii) loans from a local bank. Today, the range of options available to businesses and local governments
has expanded greatly: national commercial lending institutions with a greater community development focus;
CDFIs offering debt and equity products; micro-lending funds and rebates; and a broad range of public financing
programs, such as the USDA’s intermediary relending program and business and industry (B&I) loan program;
loans and grants from other federal agencies (i.e. EDA, HUD, EPA, and SBA); energy efficiency and renewable
energy tax credits, the New Market Tax Credit program, and Tax Increment Financing.

Yet while this greater availability of financing tools offers more opportunities to invest in economic
development in Central Appalachia, more effort is also required to understand the nature of rural capital markets
and how they shape the region’s lending needs. The Rural Policy Research Institute (2012) outlines three major
factors that have characterized rural capital market trends since 2008, which may help contextualize the broader
challenges facing rural commercial energy efficiency financing in Central Appalachia:
Major Rural Capital Market Trends since 2008

| The debt capital market is still a significant component of small business finance. | By 2010, $652 billion in total outstanding small business bank loans existed nationwide. Approximately 50% is attributed to commercial banks, and the other 50% to finance companies. |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Commercial banks remain the key institutional players in rural America. | A 2010 survey by the National Federation of Independent Businesses (NFIB) found that almost 92% of rural and urban businesses identified their primary financial institution as a bank. For rural businesses, 70% had a relationship with a local bank, and nearly 30% with a regional bank. This stood in contrast to a near 50/50 split for urban businesses. |
| Aggregate small business lending - particularly in micro commercial real estate and commercial and industrial (C&I) loans - declined significantly since the 2008 Recession, inhibiting capital investment. | From 2009-2010, aggregate small business lending decreased 6.2% among banking institutions, reflecting broader declines in the ratio of small business loans (i.e. small business loans / total business loans outstanding). This was driven by three underlying factors: (i) related declines in micro commercial real estate and C&I loans; (ii) debt supply restrictions resulting from caution on the part of banks and increased regulatory scrutiny; and (iii) reduced demand on behalf of rural business owners concerned over economic and business growth. |

2.3 Challenges in Scaling Rural Energy Efficiency

Market research conducted for this report indicates that the rural commercial building sector in Central Appalachia is among the most difficult market segments to penetrate; and that innovations in project delivery, partnerships, and financing assistance in the form of credit enhancements and specialized loan products will be required to bring it to scale. Findings were drawn from a narrow range of interviews with ESCOs, energy contractors, and lenders in the region, as well as with those operating outside of Central Appalachia but who still had some experience with rural areas.
<table>
<thead>
<tr>
<th>Market Barriers for Scaling Rural Commercial Energy Efficiency in Central Appalachia</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Little to no knowledge of the rural commercial energy efficiency market among ESCO’s and energy contractors in Central Appalachia, who tend to focus on urban areas and the rural public/institutional sector</td>
</tr>
<tr>
<td>2) Insufficient project sizes and economies of scale for rural commercial projects inhibit attention from traditional ESCOs and smaller energy contractors alike</td>
</tr>
<tr>
<td>3) Credit and insolvency concerns associated with rural commercial businesses discourages energy efficiency lending and ESCO project delivery</td>
</tr>
<tr>
<td>4) Amortization periods for rural commercial projects typically need to extend beyond conventional financing terms</td>
</tr>
<tr>
<td>5) Population decline and demographic uncertainty in rural Central Appalachian communities creates added risk for lending to rural commercial businesses</td>
</tr>
<tr>
<td>6) Rural communities tend to hire local contractors to perform energy upgrades rather than auditing energy contractors, which has discouraged ESCOs from undertaking smaller projects</td>
</tr>
<tr>
<td>7) “Split incentives” between commercial property landlords and tenant businesses has discouraged investments in energy efficiency. According to the energy contractors interviewed, multi-tenant commercial buildings are among the most difficult types of projects to finance in rural Appalachia.</td>
</tr>
</tbody>
</table>

1) **Little to no knowledge of the rural commercial energy efficiency market among ESCO’s and energy contractors in Central Appalachia.**

In general, none of the entities interviewed had significant nor direct experience in the Central Appalachian rural commercial building segment. Many of those that did operate in the region focused almost exclusively on the MUSH and federal markets for the majority of their business. The main reasons were that (i) public entities (e.g. schools, hospitals, local and county government administration) were generally seen as more stable from a cash flow, project performance, and long-term solvency perspective; (ii) tended to confer larger project sizes, physical spaces that were more geographically concentrated, and more competitive project economics than smaller rural commercial businesses; and (iii) were more qualified to take advantage of state and federal tax-benefits and financial incentives to lower project costs. Of the respondents that did focus on private commercial and industrial businesses, most if not all opportunities were located in urban areas with dense concentrations of larger companies. These trends left many respondents with little to no knowledge about what feasible opportunities
might exist in the rural commercial business segment in Central Appalachia, or of possible strategies to penetrate into the rural market.

2) **Insufficient project sizes and economies of scale for rural commercial projects inhibit attention from traditional ESCOs and smaller energy contractors alike.**

In terms of project size and market opportunities, large rural commercial opportunities (i.e. above 50,000 SQFT and $1 million total project size) were generally seen as few and far between in Central Appalachia. A large percentage of rural commercial businesses in Kentucky were characterized between 5,000-20,000 SQFT and $20,000 contract size, though were considered largely unfeasible if demanding anything longer than a 4-year payback. Respondents attributed this to short and long term business insolvency issues, risk aversion among lenders, prohibitively high transaction and financing costs, and comparatively small returns. Specifically, energy contractors cited that the cost of financing was often prohibitively high for projects under $500,000, requiring smaller projects to rely on direct equipment purchases using internal cash flow and rebates.

3) **Credit and insolvency concerns associated with rural commercial businesses discourages energy efficiency lending and ESCO project delivery.**

As for project risk, most respondents tended to avoid the rural commercial business segment because of (i) concerns over rural business credit and insolvency issues; and (ii) the fact that most energy efficiency projects required payback periods longer than what most rural businesses were willing to pay (i.e. > 2-3 years). At best, ESCO’s and energy contractors offered direct purchase agreements for projects with a payback under 4-5 years; leasing agreements for projects 5-7 years; and would not undertake projects with a payback period longer than 7 years without incentives or subsidies.

4) **Amortization periods for rural commercial projects typically need to extend beyond conventional financing terms.**

Performance guarantees were also generally limited to larger public sector customers with high degrees of performance certainty. These market characteristics often conflicted with the needs of rural businesses, as projects often needed longer periods to amortize (i.e. > 7 years) due to Kentucky’s notoriously low electricity prices (i.e. $0.05 - $0.07 per kWh) and the inability of most rural businesses to assume large debt payments designed for shorter payback periods. The vast majority of traditional lenders and CDFIs were also cited as averse to financing projects with a payback period longer than 7 years, further exacerbating this gap.

5) **Population decline and demographic uncertainty in rural Central Appalachian communities creates added risk for lending to rural commercial businesses or engaging in long-term energy efficiency work.**

Rapid population decline and economic uncertainty in many rural communities – particularly due the decline of the Kentucky coal industry and other outmigration factors – had discouraged rural businesses and public institutions alike from investing in new capital improvements beyond a period a 3-5 year period.
example, one Central Appalachian energy contractor interviewed cited the hesitancy of a public sector client - a public school system in a small rural town - to finalize a prior contract with a larger, more traditional ESCO because its rapidly declining student population and tax base (i.e. and hence, higher likelihood of closing schools) made the ESCO’s minimum 7-10 year contract requirement too risky to undertake from a financial perspective.

6) Rural communities tend to hire local contractors to perform energy upgrades rather than auditing energy contractors, which has discouraged ESCOs from undertaking smaller rural commercial projects.

For smaller commercial projects (i.e. those generally under 5,000 SQFT and $50,000 in total contract size) that did generate traction in the form of free or low-cost upfront energy audits, ESCOs cited barriers in translating these initial engagements into real business opportunities. This was largely due to a tendency among prospective rural customers to hire local contractors in their own communities to perform the work – which could be completed by one or two individuals – after the audit was completed, rather than consummate a deal with the auditing energy company.

7) “Split incentives” between commercial property landlords and tenant businesses has discouraged investments in energy efficiency. According to the energy contractors interviewed, multi-tenant commercial buildings are among the most difficult types of projects to finance in rural Appalachia.

Of the commercial business opportunities discussed, respondents cited multi-tenant buildings (i.e. strip malls) as among the most difficult rural commercial segments to penetrate. The main reason behind difficulty was a widespread “split incentive” problem that commonly arises between commercial building landlords and tenants. The “split incentive” problem is the idea that, depending on the type of lease, either tenants or landlords (but necessarily both) will reap the rewards of energy efficiency upgrades. If tenants sign a net lease, then the landlord has no incentive to help them upgrade their space or create efficiencies because the tenant captures all of the benefit. If the landlord uses a gross lease structure, then the tenant has no incentive for utilizing efficiency measures (e.g. using efficient lighting, or upgrading to a more efficiency HVAC system) because the landlord capitalizes on the tenant’s efficiency investment.

2.4 Market Precedents in Central Appalachia and Rural Areas

In light of these challenges, market research uncovered several precedents among ESCOs, energy contractors, and lenders in the region. These precedents relate to (i) energy efficiency deal size in square footage, (ii) energy efficiency deal size in monetary value, (iii) common deal structures, and (iv) contract term lengths all as a percentage of total ESCO/energy contractor portfolios.
## Energy Contractors

### Project Deal Size (Dollars) as Percentage of Total Portfolio

<table>
<thead>
<tr>
<th></th>
<th>National Energy Control</th>
<th>Earthwell Energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under $25,000</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>$25,000 - $100,000</td>
<td>40%</td>
<td>20%</td>
</tr>
<tr>
<td>$100,000 - $250,000</td>
<td>40%</td>
<td>40%</td>
</tr>
<tr>
<td>$250,000 - $500,000</td>
<td>5%</td>
<td>20%</td>
</tr>
<tr>
<td>$500,000 or more</td>
<td>5%</td>
<td>10%</td>
</tr>
<tr>
<td>Avg. Deal Size</td>
<td>$80,000</td>
<td>$250,000</td>
</tr>
<tr>
<td>Main Market Segment</td>
<td>Urban C&amp;I</td>
<td>Rural MUSH &amp; Fed.</td>
</tr>
</tbody>
</table>

### Project Deal Size (Square Feet) as Percentage of Total Portfolio

<table>
<thead>
<tr>
<th></th>
<th>National Energy Control</th>
<th>Earthwell Energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 10,000 SF</td>
<td>0%</td>
<td>N/A</td>
</tr>
<tr>
<td>10,000 – 50,000 SF</td>
<td>40%</td>
<td>N/A</td>
</tr>
<tr>
<td>50,000 – 250,000 SF</td>
<td>40%</td>
<td>N/A</td>
</tr>
<tr>
<td>250,000 SF or more</td>
<td>20%</td>
<td>N/A</td>
</tr>
<tr>
<td>Avg. Deal Size</td>
<td>50,000 SF</td>
<td>N/A</td>
</tr>
<tr>
<td>Main Market Segment</td>
<td>Urban C&amp;I</td>
<td>Rural MUSH &amp; Fed.</td>
</tr>
</tbody>
</table>

N/A - data was not obtainable
## Deal Structure, Financing, and Term as Percentage of Total Portfolio

<table>
<thead>
<tr>
<th></th>
<th>National Energy Control</th>
<th>Earthwell Energy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% Portfolio</td>
<td>Term Length</td>
</tr>
<tr>
<td>Direct Equip. Purchase</td>
<td>50%</td>
<td>&lt; 4 years</td>
</tr>
<tr>
<td>Lease/Purchase</td>
<td>40%</td>
<td>4-7 years</td>
</tr>
<tr>
<td>Lease/Purchase with Per-</td>
<td>10%</td>
<td>4-7 years</td>
</tr>
<tr>
<td>form. Guarantee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main Market Segment</td>
<td>Urban C&amp;I</td>
<td>Rural MUSH &amp; Fed.</td>
</tr>
</tbody>
</table>

## Traditional ESCOs

## Project Deal Size (Dollars) as Percentage of Total Portfolio

<table>
<thead>
<tr>
<th></th>
<th>Ameresco</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under $500,000</td>
<td>10%</td>
</tr>
<tr>
<td>$500,000 - $1 million</td>
<td>10%</td>
</tr>
<tr>
<td>$1 million - $5 million</td>
<td>60%</td>
</tr>
<tr>
<td>$5 million - $10 million</td>
<td>10%</td>
</tr>
<tr>
<td>$10 million or above</td>
<td>10%</td>
</tr>
<tr>
<td>Avg. Deal Size</td>
<td>N / A</td>
</tr>
<tr>
<td>Main Market Segment</td>
<td>MUSH</td>
</tr>
</tbody>
</table>

N/A - data was not obtainable
2.5 Potential Roles for CDFI’s

Traditional lending institutions and ESCOs generally tend to avoid financing small energy efficiency projects because of their lack of scale and higher risk profile. In result, the gap between the mainstream energy efficiency market and rural commercial businesses in Central Appalachia will continue to grow without intervention.

In light of the stated challenges, CDFI’s can bridge gaps towards energy efficiency financing and implementation in Central Appalachia through specialized products, technical assistance, and market development services tailored rural communities. CDFI’s are good candidates to do so because of:

- **Access to multiple sources of capital**, including public (e.g. grants, tax credits), private (e.g. traditional bank loans, Community Reinvestment Act allocations), and philanthropic (e.g. grants, program related investments) money that gives CDFI’s the capability to provide flexible financing solutions not otherwise possible with traditional banks.

- **An established track record in closely related sectors** (such as small business finance and various forms of real estate) that gives them the ability to address energy efficiency within familiar contexts.

- **An ability to offer below-market loan products** and other specialized forms of financing specifically tailored for “higher-risk” businesses and geographies.

- **An ability to provide business development services** that link local electricians and subcontractors with ESCO’s and energy contractors with appropriate technical expertise.

- **An ability to assume multiple leadership roles**, such as lender, convener, technical expert, capacity builder, and policy advocate.
3.0 Case Studies in Clean Energy Finance

Traditional public finance tools – such as credit enhancements, bonds, and loan guarantees – are gaining traction as a viable financing method for energy efficiency. Meanwhile, utility partnerships and unique contract structures are helping to drive down costs and mitigate risk. This section provides case studies of possible approaches to address barriers for energy efficiency finance in Appalachia, and to provide scale for MACED’s lending ambitions. Several case studies are new initiatives; as such, cases 1, 2, and 4 reflect what has been designed and authorized but not yet implemented.

<table>
<thead>
<tr>
<th>Case Study</th>
<th>Method</th>
<th>Customer Segment(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. State of Hawaii</td>
<td>Credit enhancements via utility systems benefit charge (i.e. the “green infrastructure charge”)</td>
<td>Residential and commercial – esp. “underserved” markets, such as low- and moderate-income homeowners, renters, and non-profits</td>
</tr>
<tr>
<td>2. State of Vermont</td>
<td>Bank loan guarantees via loan loss reserve accounts</td>
<td>Commercial energy efficiency loans</td>
</tr>
<tr>
<td>4. State of New York</td>
<td>Public credit enhancements to private lenders and lease financing entities</td>
<td>Targets “power resiliency improvements” for critical public &amp; private infrastructure</td>
</tr>
<tr>
<td>5. Tennessee Valley Authority and Pathway Lending</td>
<td>Direct Financing Through Low-Interest Loans</td>
<td>All property types and project sizes</td>
</tr>
</tbody>
</table>
3.1 Hawaii Green Infrastructure Loan Program: Systems Benefit Charge As a Credit Enhancement for Bonds

In 2013, the State Legislature of Hawaii passed Senate Bill 1087\textsuperscript{91} authorizing a new loan fund model – the Green Energy Market Securitization Program – to finance the purchase and installation of clean energy and energy efficiency projects for residents and businesses. Set for official implementation in 2014, the program will combine bond financing that has been credit enhanced with a dedicated utility surcharge (i.e. “the green infrastructure charge”) with utility on-bill repayment for participating customers,\textsuperscript{92} including traditionally “underserved” market segments such as low- and moderate-income households, renters, and non-profits. \textsuperscript{93}

The Hawaii program is unique because it accesses the capital markets with an investment grade security that does not require the state’s general obligation guaranty.\textsuperscript{94} Instead, the program will set a national precedent by using the state’s existing clean energy “systems benefit charge” mechanism as a credit enhancement to support a bond issuance; one of the first approaches of this type in the country.\textsuperscript{95} A systems benefit charge (SBC) is a charge on a customer’s bill from an electric distribution company that is dedicated to help pay for the costs of certain public benefits programs; in this instance clean energy and energy efficiency projects.\textsuperscript{96} In most states, SBC funds are managed by a public entity that deploys the funds in various subsidy and financing programs.\textsuperscript{97}

The green infrastructure bonds to be issued are revenue bonds paid for primarily by the underlying loan payments from participating homes and businesses.\textsuperscript{98} The bonds will not require the State’s general obligation guaranty, and are excluded from the calculation of the State’s debt limit.\textsuperscript{99} This can be done because the key credit enhancement for the prospective bonds are the mandatory fees and charges that the PUC is authorized to collect on all existing and future customers through the SBC mechanism.\textsuperscript{100} These SBC funds will be deposited in the State’s “green infrastructure bond fund” and pledged and applied to the repayment of the bonds.\textsuperscript{101}

According to the Clean Energy Group,\textsuperscript{102} it is this ability to recover any shortfall in loan payments from participating consumers through potential charges on all ratepayers that produces an investment grade rating for the bonds. The Public Utility Commission (PUC) is also required to ensure that “all reasonable costs incurred by electric utilities to start up and implement the loan program may be recovered as part of the electric utility’s revenue requirement” (Sanders et al. 2013). The finance model is expected to remove barriers for developing clean energy projects by providing broader access to low cost utility tariff-financed bonds that are sold to private investors, such as pension funds.\textsuperscript{103} The result is that participating utility customers can readily obtain low cost loans that are repaid through on-bill charges on their utility bills.\textsuperscript{104} The model supports future clean energy investment by pledging credit enhancements based on future SBC tariffs.\textsuperscript{105}
The key requirement for issuing these types of investment grade bonds is obtaining the legislative and regulatory approvals necessary to establish an irrevocable “true-up” mechanism. According to the Clean Energy Group, the actions needed to achieve this are below:

<table>
<thead>
<tr>
<th>Criteria to Create the “True-Up” Mechanism(^{107})</th>
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<tbody>
<tr>
<td>• The SBC tariff needs to be established as a clear revenue source</td>
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<tr>
<td>• Enabling legislation, the tariff and related regulations must be protected by subsequent legislatures and commissions</td>
</tr>
<tr>
<td>• Applicable statutes need to include a “non-impairment” pledge</td>
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<tr>
<td>• A utility tariff “true-up” mechanism must be applied annually</td>
</tr>
<tr>
<td>• The legislation and regulations must provide for “non-bypassable charges” to be imposed and collected from customers connected to the distribution network</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Benefits of the SBC “True-Up” Mechanism</th>
</tr>
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<tbody>
<tr>
<td>• It addresses institutional investors’ credit concerns and obviates concerns over insufficient payment performance data regarding each clean energy asset class</td>
</tr>
<tr>
<td>• It addresses the traditional difficulty of residential and small commercial projects in accessing the institutional investor market, which has clear portfolio credit rating and yield requirements</td>
</tr>
<tr>
<td>• By accessing low-cost AAA-rated capital, a larger pipeline of projects can qualify for financing on economically feasible terms</td>
</tr>
<tr>
<td>• By scaling demand and the number of financeable projects, institutional investors begin to see the scale of investment opportunity they need in order to model their portfolios with clean energy as a specific asset class. With scale and increased volume, transaction cost efficiency will increase.</td>
</tr>
</tbody>
</table>
3.2 State of Vermont: Providing Guarantees for Bank Energy Efficiency Loans Through Loan Loss Reserve Cash Accounts

Due to a bill passed by the Vermont State Legislature in the summer of 2013, the Vermont Economic Development Authority (VEDA) will be managing a new bank loan guaranty program for energy-related loans. The guarantee program will be backed by a VEDA-funded reserve, funds from the Vermont Public Service Department, and federal funds awarded to the Vermont Energy Investment Corporation for sustainable energy projects. VEDA will guarantee up to seventy-five percent of the amount of any loan, not to exceed a guaranty of $250,000 in value. Eligible uses of proceeds can be used to (i) purchase land and buildings, new construction or existing facility renovations or refurbishment, (ii) purchase and install new machinery and equipment, and (iii) pay for the design, engineering, and permit fees for qualified energy projects. According to the Clean Energy Group (2013), the program expects to leverage approximately $10 million in private capital, though it is in its early implementation stages and its effectiveness remains to be seen.

3.3 State of New York: Providing Credit Enhancements to Private Lenders and Lease Financing Entities

In response to calls for more resilient infrastructure in the wake of Hurricane Sandy, the New York State Energy Research and Development Authority (NYSERDA) created the Resiliency Retrofit Fund (RRF) to provide energy-related infrastructure projects with lower cost access to the capital markets through loan loss reserves. The RRF will provide credit enhancements to private lenders and lease financing entities that finance resiliency improvements, such as microgrids, energy efficiency, and distributed generation. NYSERDA has proposed to use federal Community Development Block Grant (CDBG) funds to create a $30 million RRF from which it will deposit an agreed amount into a loan loss reserve account held by each participating lender.

The RRF will provide credit enhancements to incent private lenders and lease financing entities to extend financing for energy related resiliency projects, and offer financing on more attractive terms. In the event of default by a borrower or lessee on an RRF-approved contract, the RRF proposes to reimburse participating lenders for eighty percent of the outstanding principal balance. NYSERDA anticipates that future lending through the RRF will also include credit enhancements for bond issuances. While it is unclear whether CDBG funds will be used for the RRF at the time of this writing, NYSERDA appears committed to leverage private lenders’ capital for resilient power projects by providing this credit enhancement tool.

One of the main barriers facing energy efficiency implementation is its tendency to compete with “mission critical” aspects of a business’s capital budget, such as important equipment or processes whose disruption can induce business failure.\(^{118}\) This competition often compels businesses to defer or thinly spread energy-related investments over long periods of time to make room for critical budget allocations.\(^{119}\) The resulting tradeoff is most visible in net lease scenarios, where energy costs are passed down to tenants that do not have full control over managing building energy systems; and when owners themselves are not motivated to invest in energy efficiency, resulting in a split incentive.\(^{120}\) Additionally, loans drawn for capital expenses typically result in liens that are assigned directly to building owners subordinate to their existing mortgage. This additional repayment risk often creates potential issues with senior lenders, further stunting market development. Moreover, when the tenant (i.e. residential or commercial) is undertaking the improvement as the borrowing entity, it is not able to pledge the property as collateral for the loan.

To overcome these barriers, the City of Seattle, Seattle Foundation, and Seattle Steam piloted a program in 2011 partnership with energy contractor, MacDonald Miller Facilities Solutions (MMFS), to transform investments in energy efficiency from a capital expense to an on-going operational expense through utility on-bill financing. In the program, energy efficiency investments are made on the customer side of the utility meter. In turn, MMFS (the partner energy contractor) provides turnkey project development, implementation, and savings guarantees through an Energy Services Agreement with the customer. Customer payments are made through an on-bill repayment mechanism, which is considered to be different than a loan since MMFS commits to pay lenders through the energy savings. Payments are collected on the Seattle Steam bill, and lenders on the project get paid first in the order of disbursement. By transferring loan repayment obligations into a property’s utility bill, the approach encourages efficiency investments regardless of building ownership.

The key to on-bill financing is that it decouples decision-making for energy efficiency from traditional capital expenditures by assigning revenue created from energy savings to monthly loan payments. These payments are “baked” into a property’s utility bill, and assigned through a lien to the utility meter (as is done with the residential energy efficiency finance programs MACED currently has in place with several local utilities and rural electrical cooperatives). The lien stays with the building regardless of ownership until it is fully paid. When changes in property ownership occur, a UCC filing is triggered to address remaining outstanding debts on the property. New property owners have the opportunity to buy out the remaining debt by incorporating it into the purchase price of the property, or continue paying off the loan as part of the monthly utility bill. According to MacDonald Miller,
courts view HVAC and utilities as an “essential building use,” and will order outstanding utility bills to be paid in the case of a default. This helps to further mitigate risk.

The economic principle driving the operating cash flow is that it aggregates investments on behalf of building owners, and does so regardless of ownership. Third party financing from different sources – such as grants and low interest loans – contribute to a “stack” of funding resources to minimize the overall cost of financing. This pool of funds, which is managed as a revolving loan fund by a Special Purpose Entity (in this case MacDonald Miller Energy Capital Solutions), disburse loans for energy efficiency improvements with the utility and its associated billing system as the collections vehicle. The loan fund is expandable, meaning it can accept additional capital on a continued basis. As the pool of funds demonstrate demand and favorable returns and risk profiles, traditional lenders with more stringent underwriting criteria will be recruited to purchase securitized debt generated by the loan fund, and can further capitalize the fund through direct investments. Proponents of the model suggest that the minimum size threshold to attract traditional lenders in this way is approximately $10 million.121

On-bill financing is advantageous because of its flexibility to finance projects without a minimum or maximum size. While many traditional banks often avoid projects under $1,000,000, the model has gone as low as $100,000 to date as the capability to do smaller projects. And while the model largely relies on energy savings to cover amortization, building owners are also free to pay premiums on top of monthly utility bill in the event particular building improvements are more expensive than the savings can guarantee. There is a fixed repayment obligation for the term, which may be upwards of ten years.

The target size for the fund is $40 million, with the City of Seattle, Seattle Foundation, State of Washington, Department of Energy, and American Recovery and Reinvestment Act contributing the first $11 million in the form of grants and Program Related Investments (PRI). In creating tranches of securitized debt approximately $10 million in size, the partners hope to raise additional capital by sell bundled contracts of energy efficiency loans to traditional financial institutions on a secondary market. They also hope to restructure the debt profile of projects to lower the interest rate for on-bill financing and help the model achieve greater scalability.

3.5 Tennessee Valley Authority: Lowering Capital Costs Through Loan Loss Reserves and Lines of Credit

The TVA “In-Home Evaluation Program” offers low cost financing for energy efficiency and renewable energy improvements to customers throughout the TVA service territory in partnership with a local CDFI, Pathway Lending. The program supports the customer bases of over 150 utilities (including Louisville Gas & Electric) through a series of low interest loans and marketing and vendor partnerships. The loans are provided through a pool of low-cost financing, which was capitalized by state TVA grants and a private bank partner, and supported by a line of credit
from Pinnacle Bank in Nashville.

The thrust of the program is its streamlined, below-market terms for all loans: (i) 2% interest for 5 years on EE, and (ii) 5% interest for 10 years for renewable energy. Interest rate buy-downs are provided to Pathway Lending in the form of grants on the back-end, which make up for the spread between the market interest rate it would otherwise earn and the below-market interest rate on the loan. If original payback terms are projected to be longer than 5 or 10 years, borrowers must fill the remaining gaps with equity. No performance guarantees are given; rather, clients must pay back the full amount of the loan even if energy savings are not realized.

Prior to the standardized loan term strategy, the TVA-Pathway Lending program approached each loan on a deal-by-deal basis. In this case, the program tailored contract terms to each individual loan, which resulted in higher transaction costs and significantly less capital deployed. According to program representatives, the program was more effective at moving greater amounts of capital faster after switching from deal-by-deal contract structures to a standardized loan product.

According to interviews, the standardized, below-market loan product on its own has not been enough to entice commercial energy efficiency retrofits. Since the program’s inception, customers have often needed to pair loans with commercial rebate incentives from the TVA to pay for the upfront cost of energy efficiency improvements. Pathway Lending reports that while the loan program was successful with the rebates in place, customers are now refraining from drawing new loans until the TVA reinstates a new round of commercial rebate incentives; which are expired at the time of this writing. This current absence of demand for Pathway Lending’s product suggests that interest rate buy-downs and standardized loan products may not be enough on their own to incentivize energy efficiency investments in Central Appalachia; but rather, that additional utility rebates may be required.
4.0 MACED’s Existing Toolset

The Mountain Association for Community Economic Development (MACED) is a CDFI serving 54 counties of Eastern Kentucky whose goal is to provide economic alternatives in Central Appalachia through a focus on sustainable development. Three core strategies comprise MACED’s mission:

- **Community investment** – investing capital and capacity-building technical assistance in people and enterprises to create economic opportunities, protect natural and cultural assets, and provide critical services

- **Demonstration Initiatives** – developing new approaches to old problems and testing them out on the ground

- **Research and Communications for Policy Change** – conducting research around policy opportunities and barriers that result in better development practice and opportunities for people who meet them

MACED’s program of work follows three paths that flow directly from these core strategies:

- **Strengthening key sectors** – growing the size and strength of important sectors to the region – such as energy and forestry – through a wide range of financial, policy, and technical assistance tools.

- **Promoting entrepreneurship and homegrown development** – supporting Central Appalachian entrepreneurs and enterprises through loans and technical assistance tailored to small business and non-profit needs

- **Influencing Kentucky’s economic policy and an Appalachian Transition** – providing information and analysis to help citizens and decision makers convene around important issues related to long-term regional prosperity
### 4.1 MACED Experience in the Energy Efficiency Sector

MACED has convened three core programs to help increase the uptake of energy efficiency upgrades in its service territory:

<table>
<thead>
<tr>
<th>Energy Efficient Enterprises</th>
<th>This program helps business enterprises become more energy efficient through means such as:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Lighting, HVAC, and other building systems improvements</td>
</tr>
<tr>
<td></td>
<td>• Grocery refrigeration and waste heat reduction</td>
</tr>
<tr>
<td></td>
<td>• Combined in-house capacity to perform energy audits with underwriting capabilities for microloans ranging from $1,000 to $50,000 in size, and standard loans above $50,000</td>
</tr>
<tr>
<td></td>
<td>• Facilities energy cost savings programs in partnership with qualified ESCOs and energy contractors</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How$mart Kentucky</th>
<th>This program works with electric cooperatives to fund energy efficiency retrofits for residential buildings through on-bill financing. Key aspects of the program include:</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>• Coordinating “whole house” energy assessments with certified Building Analysts under the Building Performance Institute</td>
</tr>
<tr>
<td></td>
<td>• Utility determination of the best upgrade package that can be financed out of project savings</td>
</tr>
<tr>
<td></td>
<td>• Utility incentives, MACED loans, and other sources of funds to help finance the efficiency improvements</td>
</tr>
<tr>
<td></td>
<td>• Utility oversight on installing efficiency upgrades at no upfront cost to the customer</td>
</tr>
<tr>
<td></td>
<td>• Residential meter is assigned a fixed monthly charge to pay off the efficiency upgrade as part of its standard utility service, as the loan is made to the utility and stays with the meter regardless of ownership.</td>
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</table>

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<thead>
<tr>
<th>Energy Policy Advocacy</th>
<th>This program helps advance state policy that supports investments in energy efficiency and renewable energy. Key partnerships include:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Kentucky Sustainable Energy Alliance, a statewide energy advocacy, education, and technical assistance organization</td>
</tr>
<tr>
<td></td>
<td>• Kentucky Solar Partnership – to provide low interest loans, education, and awareness for commercial solar and renewable energy projects</td>
</tr>
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</table>
5.0 Recommendations for Scaling Energy Efficiency

MACED can pursue a variety of avenues to address barriers to energy efficiency investment in the rural commercial building sector and build on its existing energy efficiency product offerings. These are organized into recommendations related to (i) positioning, (ii) products, and (iii) partnerships with ESCOs and energy contractors in the region, along with federal, state, and national CDFI programs.

<table>
<thead>
<tr>
<th>Positioning</th>
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</table>
| 1. Aggregate smaller deals into single contracts to lower transaction costs  
2. Segment the market to prove specific deal types and achieve scale  
3. Establish a standardized Letter of Intent (LOI) process to vet potential deals  
4. Use energy benchmarking software to vet utility data/new loan opportunities |

<table>
<thead>
<tr>
<th>Products</th>
</tr>
</thead>
</table>
| 1. Equipment leases  
2. Standardized Loans  
3. Credit Enhancements |

<table>
<thead>
<tr>
<th>Partnerships</th>
</tr>
</thead>
</table>
| 1. Create a streamlined CDFI-ESCO/energy contractor partnership to lower transaction costs  
2. U.S.D.A. Business & Industry (B&I) Loan Guarantee Program  
3. Kentucky Small Business Credit Initiative  
4. National Development Council (NDC) “Grow America Fund” (GAF) |
5.1 Positioning

MACED can pursue a variety of strategies to position itself as an energy efficiency-focused lender in Central Appalachia, and help build the market for rural commercial energy efficiency.

**Contract Aggregation.** For commercial buildings below 10,000 SF, applying a “contract aggregation” approach would help MACED and ESCOs/energy contractors penetrate into the rural commercial business segment. Respondents indicated a minimum deal-size threshold of $25,000, and that transaction costs should typically not exceed more than 3% of total contract value. MACED could lower transaction costs, improve deal economics, and promote greater economies of scale by aggregating multiple projects into one standardized contract.

**Market Segmentation.** To support contract aggregation, MACED should segment the market to identify sectors with the greatest potential for energy savings, and to improve the “market learning curve” and economies of scale for serving rural communities. Example market segments could include grocery stores, restaurants, hospitality, and small manufacturers. This approach would help create broader market precedents around contract language and establish market expectations for specific types of deals.

**Standardized Customer Letter of Intent (LOI) Process.** Energy contractors expressed an unwillingness to pursue smaller commercial projects because of customer tendencies to hire other local workers after receiving the contractor’s free upfront energy audit. To ameliorate this issue, a standardized LOI process should be used to vet the intent and substantive nature of potential deals. This process is already common in the traditional ESCO industry, where LOI’s increase the likelihood that prospective clients will move toward consummating a deal if the upfront energy audit reveals that specific types of projects are viable within a particular payback period (e.g. lighting and HVAC under 5 years).

**Applying energy-benchmarking software to screen opportunities.** Working with local utilities to obtain customer energy use data – pared with energy-benchmarking software – may help MACED better understand the market and more efficiently expand into new business opportunities.

5.2 Products

**Equipment Lease Option.** Financing equipment-leasing arrangements could help build MACED’s existing energy efficiency offerings. Commercial leases fall into two general categories: (i) operating leases and (ii) capital leases. In an operating lease, monthly payments are usually lower than loan payments because the lessor owns the asset, and the lessee’s payments do not build in equity. The lessee uses the equipment during the term, and it is expected that they will return the equipment at the end of the leasing period. Lease calculations must include
assumptions that leased asset’s residual value can be recovered at the end of the leasing term. Equipment that retains its value – such as a well-maintained generator in a cogeneration project – would have a greater likelihood of qualifying for an operating lease (which would be treated as an “off-balance sheet” or operating expense) than would equipment with little to no residual value at the end of the leasing period, such as a lighting project. Equipment that does not retain its value, and is leased under certain conditions related to lease term, transfer of ownership, and the lessor's equity in the asset, would be treated as a capital lease.

**Standardized Loan Products.** Mimicking the TVA-Pathway Lending case study, MACED should work with the TVA and sources of patient capital (i.e. public agencies, foundations, etc.) to provide a standardized loan product with streamlined terms and interest rates. TVA sponsors such arrangements for customers and lenders in its service territory by providing low interest loans and marketing and vendor partnerships. According to Pathway Lending, this approach proved to be more efficient at moving greater amounts of capital faster than the alternative of designing contract terms on a deal-by-deal basis, though additional commercial rebate incentives may be required to create program demand.

**Credit Enhancements.** Due to their small size and credit risk, rural commercial projects were identified as the most in need of financial support as many already heavily rely on utility rebates and grants to buy-down upfront project costs. Respondents expressed that a formal credit enhancement framework would help to address this market barrier. Simply stated, credit enhancement is financial risk reduction. It is a set of financial measures that reduce credit risk and strengthen the credit rating of a financial transaction. This in turn helps to lower the cost of financing. The following tools are regarded as common forms of credit enhancement:

<table>
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<tr>
<th>Loan Guarantees</th>
<th>Interest Rate Buy-Downs</th>
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<tr>
<td>Debt Service / Loan Loss Reserves</td>
<td>Credit Insurance Products</td>
</tr>
<tr>
<td>Subordinated Debt</td>
<td>Cash Flow Considerations</td>
</tr>
</tbody>
</table>

**Loan Guarantees.** A loan guaranty is a legally binding agreement where the guarantor is obligated to pay some or all of what is due on the debt in the event the borrower fails to pay. As an example, states often elect to guarantee real estate and infrastructure loans with a Private Activity Bond (PAB). PAB’s are a form of bond financing whereby the state or issuing authority pledges its general obligation support, i.e. its full faith and credit to the issuances of local governments or to a pooled bond credit. Because investor earnings on a PAB are tax-exempt, issuing authorities can secure a lower interest rate and offer lower cost financing. PAB’s are also proven strategy for raising private resources for a broad range of “exempt” facilities, including manufacturing and certain forms of commercial real estate. While Internal Revenue Service code currently prevents PAB’s from broad application in the energy sector, this may be subject to future policy change.
**Debt Service Reserves and Loan Loss Reserves.** Debt service reserves refer to cash held in a dedicated account that is available to pay interest and principal payments for a designated number of months in the event of borrower default.\(^\text{135}\) Loan loss reserves, which may be funded with public assistance, are intended to help cover losses in the event of loan foreclosure.\(^\text{136}\) These tools help strengthen collateral available in a transaction by providing liquid funds (i.e. cash or readily converted to cash) held in a dedicated account.\(^\text{137}\) Respondents indicated that funds otherwise dedicated as utility rebates and grants could be applied to debt service reserves and loan loss reserves in Kentucky. This may help to lower risks associated with rural commercial projects and maximize the amount of private dollars leveraged.

**Subordinated Debt.** A public agency or other lender may agree to allow their loan to hold a lower priority position than senior lenders in a transaction. If there is a loan default, lenders with subordinated debt will generally not be repaid until after the senior debt holders are paid in full. This places the senior lenders in an enhanced position in relation to cash flow and collateral and reduces their risk. While this may be less preferred strategy due to high risks associated with rural commercial projects, convening lenders or public resources to create subordinated debt products may help leverage greater levels of private resources.

**Interest-Rate Buy-Downs.** A public agency, in order to accomplish certain policy objectives, may “buy down” the market interest rate of a loan by providing grant funds that preserve or enhance the lender’s interest rate while at the same time providing a below-market interest rate loan to the borrower.\(^\text{138}\) The lower cost financing increases the borrower’s cash available to repay the loan and reduces the lender’s risk.\(^\text{139}\) Interest rate buy-downs are one of the principal mechanisms used in the TVA-Pathway Lending case, which utilized state grant money to fill in gaps between lower interest loans offered to projects and market interest rates.

**Credit Insurance Products.** For bond financing, insurance can be obtained from specialized insurance companies that agree to make scheduled payments of interest and principal on a bond in the event a payment default occurs by the issuer.\(^\text{140}\) Because of this risk reduction, insured bonds are often priced higher, have lower interest rates, and are more liquid (i.e. can be bought and sold easily without a sharp loss in value).\(^\text{141}\)

**Backing Rights to Project Cash Flow & Collateral with Credit Enhancements.** As best practice, respondents advised that MACED apply credit enhancements in a tiered framework to support higher order rights to project cash flow and collateral:\(^\text{142}\)

   - Payments should remit to the lender, who then remits the balance to the ESCO or energy contractor. This allows the lender to maintain payments if disputes arise on whether the work was adequately performed.

   - Obtain an assignment against the payment stream, followed by a U.C.C. filing

   - Take equipment and fixtures as collateral and obtain a first lien against the them through a U.C.C. filing to
make it clear the lender has precedent

- Additional collateral should be evaluated (e.g. second mortgage, leasehold lien on other equipment/premises, or outside assets (e.g. extra real estate)

- Upon agreement with a commercial borrower, take utility rebates and apply them towards retiring the debt, a debt service reserve, or a loan loss reserve.

5.3 Partnerships

Beyond actions related to positioning and products, MACED can consider broader strategies to support a scalable rural commercial lending product in Central Appalachia. MACED should consider partnering with a local ESCO or energy contractor, as well as state, federal, and national CDFI programs to create specialized loan products for rural commercial energy efficiency, and to advocate for policy changes to help bring them to fruition. The following programs offer different tools and types of credit enhancement that could help scale MACED’s lending ambitions.

Streamlined CDFI-ESCO/Energy Contractor Partnership. Respondents suggested that a formal partnership with MACED – e.g. on the basis of a multi-year agreement – would offer opportunities to establish standardized agreements, common criteria for sourcing and underwriting deals, and a means to lower transaction costs. An ESCO/energy contractor partnership would confer several benefits, including:

- Marketing partner for existing MACED energy efficiency products

- Contract aggregation assistance

- Added energy auditing and contract management capacity

- Potential equipment cost savings or volume discounts on aggregated projects

- Surer footing for expanding into new markets, such as the rural MUSH sector (e.g. community health care facilities, which CDFI’s elsewhere have targeted)

USDA Business & Industry (B&I) Loan Guarantee Program. The USDA Rural Development program has an established track record for supporting community development projects throughout Appalachia with a wide variety of credit enhancement tools, including B&I Loan Guarantees. MACED should explore the B&I program and
others at the USDA as a possible credit enhancement tool for energy efficiency loans.

The USDA Business & Industry (B&I) Guaranteed Loan Program has become an increasingly popular tool for rural clean energy financing. While a general economic development program, B&I Loan Guarantees can be given to businesses that make capital investments in energy efficiency and renewable energy projects. The percentage of the loan guaranteed depends on the size of the loan: (i) 80 percent guarantee of loan amounts up to and including $5 million; (ii) 70 percent guarantee of loan amounts greater than $5 million, up to and including $10 million; and (iii) 60 percent guarantee of loan amounts greater than $10 million.

The B&I program requires the participation of an eligible lender, including CDFIs. Lenders would determine the loan's terms (within program guidelines), disburse the funds, and must hold at least 5 percent of the unguaranteed portion for the life of the loan. The guaranteed portion of the loan can be resold in the secondary market, and interests in the remaining 95 percent of the unguaranteed portion can be shared through participations (with the designated lender retaining title to the notes but not the economic interest in them). The same collateral secures the guaranteed and unguaranteed portions of the loan, with equal lien priority.

**Kentucky Small Business Credit Initiative (KSBC).** In August 2013, the Kentucky Governor introduced the KSBC as a major new small business initiative that will provide Kentucky’s small businesses with access to nearly $155 million in new loans to help with job creation across the State. MACED should explore the viability and focus of KSBC’s underlying framework to determine whether the State would be open to tailoring part of the program for the rural commercial energy efficiency sector.

Administered by the Kentucky Cabinet for Economic Development (“the Cabinet”) and the Kentucky Economic Development Finance Authority, this program is designed to generate jobs and increase the availability of credit to small businesses by reducing the risk assumed by participating Kentucky lenders, credit unions, and CDFIs. The initiative is designed to leverage funding from these private sector sources to help finance creditworthy small businesses that typically fall outside normal underwriting standards. Three programs comprise the KSBC:

**Kentucky Capital Access Program:** offers loan portfolio insurance to private financial institutions and encourages them to loan to creditworthy small businesses. It provides a matching contribution to a lender’s loan loss reserve account when lenders extend credit to qualified small businesses. Lenders may draw on the account to offset losses in the event of loan foreclosure.

**Kentucky Loan Participation Program:** assists borrowers whose cash flow does not meet a lender’s coverage requirements by allowing the Cabinet to purchase (or participate in) a portion of the loan from the lender. The program offers the borrower, on the portion it is lending, a payment-free grace period up to 24 months.
Kentucky Collateral Support Program: provides a pledged asset (cash) to a lender for consideration in making a loan to a small business. This helps enhance the lender’s ability to underwrite the loan.

National Development Council “Grow America Fund.” The NDC “Grow America Fund” (GAF) has a proven track record for raising low cost capital for community development projects in underserved areas through relationships with the federal Small Business Administration (SBA) and national investment partners. MACED should explore the possibility of partnering with NDC to create a “Grow Appalachia” or “Grow Kentucky” fund similarly structured to the GAF.

GAF provides financing to growing small businesses throughout the country. GAF operates as a community development lender to support job creation and eligible small business expansion in underserved areas. The financing provided is partially guaranteed by the U.S. Small Business Administration under GAF’s Small Business Lending Company license, and GAF has “Preferred Lender Status” nationwide.

GAF lending differs from conventional lending by providing:

- Longer terms. Using repayment schedules up to 25 years, GAF gives borrowers a smaller monthly loan payment to reserve cash flow for other business needs
- Larger Loans. GAF loans range from $150,000 to $3.4 million
- Lower Down Payments. GAF helps preserve a business’s equity
- Customized Structures. GAF matches the term of the loan to the life of the assets being financed, ensuring that debt service does not exceed available cash flow.
6.0 Bibliography


Energy Efficiency and Renewable Energy, Weatherization, and Intergovernmental Program.


7.0 Citations

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4 (Patrick, 2012)
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6 http://www.thesolutionsjournal.com/node/717 (Patrick, 2012)
7 (Patrick, 2012)
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10 (Patrick, 2012)
11 (Satchwell, Goldman, Larsen, Gilligan, & Singer, 2010)
12 (Brown, et al., 2009)
13 (Brown, et al., 2009)
15 Conversation with Perry England of McDonald Miller Facilities Solutions
16 (Sanders, Milford, & Rittner, 2013)
17 (Sanders, Milford, & Rittner, 2013)
21 Including Earthwell Energy Inc. and National Energy Control
24 EECBG & SEP Technical Assistance Program, Energy Service Company (ESCO) Benchmarking Project, “Post


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29 (Satchwell, Goldman, Larsen, Gilligan, & Singer, 2010)

30 (Baechler & Webster, 2011)

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32 (Stuart, Larsen, Goldman, & Gilligan, 2013)

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34 Data sourced directly from (Stuart, Larsen, Goldman, & Gilligan, 2013)

35 Performance based contracting accounted for 69% of 2008 revenues, and 70% 2006 revenues (LBNL, 2013; Satchwell et al, 2010; Hopper et al. 2007)

36 (Stuart, Larsen, Goldman, & Gilligan, 2013)

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46 (Baechler & Webster, 2011)

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48 Section taken as a direct excerpt from (Baechler & Webster, 2011)

49 (American College & University Presidents’ Climate Commitment, 2013)

50 (American College & University Presidents’ Climate Commitment, 2013)

51 Karl Seidman, personal communication, September 12, 2013

52 (American College & University Presidents’ Climate Commitment, 2013)

53 (American College & University Presidents’ Climate Commitment, 2013)

54 (American College & University Presidents’ Climate Commitment, 2013)

55 (American College & University Presidents’ Climate Commitment, 2013)

56 (Thumann & Woodroof Ph.D., 2005)
In some TELP arrangements, lessees may actually take title to the equipment while the lender still holds a security interest in the assets. Like operating leases, TELP agreements may be considered as an operating rather than capital expense, allowing public entities to avoid both the obligation to count it as “debt” as well as voter referendums that might otherwise be required. (American College & University Presidents’ Climate Commitment, 2013)

Direct quote from (Stuart, Larsen, Goldman, & Gilligan, 2013)

See “Community Development in Rural America: Regional, Collaborative, and Comprehensive” at http://www.whatworksforamerica.org/ideas/community-development-in-rural-america-collaborative-regional-and-comprehensive/#.Uk2vA45Cg_5

Personal testimony from Johnny Miller of Earthwell Energy

Interview with National Energy Controls, Utilities Dynamics, Earthwell Energy and the Vermont Energy Investment Corporation

Interview with Utilities Dynamics


Interview with Vermont Energy Investment Corporation

Interview with National Energy Control and Utilities Dynamics

Interview with Earthwell Energy
Interview with Earthwell Energy
Interview with National Energy Control, Earthwell Energy, Utilities Dynamics
(Zimmerman, 2009)
(Zimmerman, 2009)
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https://financere.nrel.gov/finance/content/community-development-financial-institutions-providing-clean-energy-capital


(Sanders, Milford, & Rittner, 2013)


(Sanders, Milford, & Rittner, 2013)


(Sanders, Milford, & Rittner, 2013)

(Sanders, Milford, & Rittner, 2013)
Interview with Perry England of MacDonald-Miller Facilities Solutions

Information drawn from the MACED website as well as input from MACED employees

Phone interview with Johnny Miller of Earthwell, Inc. and Perry England of McDonald Miller Facilities Solutions


Interview with Robert Sanders of the Clean Energy Group


All information accessed at Kentucky Small Business Credit Initiative Fact Sheet: http://thinkkentucky.com/kyedc/pdfs/KSBCIFactSheet.pdf

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8.0 List of Interviews

Conducted primarily via phone between July 2013 and December 2013

Energy Contractors and ESCOs

1. Ameresco – Brian Duvall, Head Engineer
2. Earthwell Energy, Inc. – Johnny Miller, Founder and CEO
3. National Energy Controls – Rick Wooliver, Partner
5. MacDonald Miller Facilities Solutions – Perry England, Vice President of Building Performance

CDFIs, Lenders, and Finance Consultants

1. Pathway Lending – Brandon England, Assistant Client Manager
2. Craft3 – Desiree Sideroff, Vice President Product Manager
3. Natural Capital Investment Fund – Hannah Vargason, Project Manager
4. Clean Energy Group – Robert Sanders, Senior Finance Advisor
5. JP Morgan – Joel Spenadel, Executive Director
**Government**

1. Kentucky Department of Energy Development and Independence – Lee Colten, Assistant Director

**Industry Associations**

1. National Association of Energy Service Companies (NAESCO) – Terry Singer, Executive Director