UNDERSTANDING BARRIERS AND EVALUATING PATHWAYS TO THE LONG-TERM VIABILITY OF FEDERALLY FUNDED ENERGY EFFICIENCY PROGRAMS

BY

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ABSTRACT

In 2009, the U.S. Department of Energy allocated $508 million to the Better Buildings Neighborhood Program (BBP), a competitive grant program to spur a private energy efficiency retrofit market in the residential and commercial buildings sectors of the U.S. economy. The BBP was funded through the Obama administration's American Recovery and Reinvestment Act, with the goal of creating jobs and impacting the economy through clean energy investments.

This report investigates one of the BBP grant recipient partners, the Southeast Energy Efficiency Alliance (SEEA), and the unique challenges of energy efficiency deployment in the Southeast. The analysis provides SEEA's program managers with a framework to evaluate options for the long-term viability of their energy efficiency retrofit programs post-federal funding in 2013. These options were designed as a deliverable to SEEA in the form of a guidebook, which was completed in March 2012. Selected sections of the guidebook can be found in the Appendix and will be referenced throughout the report.

Additionally, this report will consider the current barriers that SEEA's programs are facing and how they are impeding the organization's likelihood of meeting goal criteria within the mandated time frame. The final recommendations will include programmatic changes that SEEA can adopt over the next year and a half to overcome both the short-term and long-term challenges of energy efficiency retrofit programs in the Southeast.

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Introduction:

The U.S. federal government signed the American Recovery and Reinvestment Act (ARRA) into law in February 2009, in response to the severe economic recession of the late 2000's. The rationale for its formulation was to stimulate the economy by providing nearly $746 billion in the form of tax cuts and benefits, entitlement programs, contracts, loans and grants.[i] ARRA's goals were to create jobs and encourage long-term growth in the U.S. economy. During this same period, the global community and the United States in particular, became more aware of the environmental and political pressures that were mounting regarding energy security and excessive consumption in an era of high energy prices.

In late 2009, ARRA approved $508 million to the Department of Energy (DOE) to administer the Better Buildings Neighborhood Program (BBP). This competitive grant program was meant to spur economic growth by leveraging private capital, creating jobs and producing energy savings between 15 to 30 percent through energy efficiency retrofit projects. The Southeast Energy Efficiency Alliance (SEEA) is a non-profit organization that received a $20 million grant through this program to launch thirteen "local energy alliances" throughout the Southeast. Between 2010 and 2013, SEEA must utilize these funds to complete 10,000 residential and commercial energy efficiency retrofits. SEEA's long-term goals are similar to that of the BBP: stimulate the local economy and create a lasting retrofit market in the Southeast region. In order to achieve these broader economic goals, SEEA's local energy alliances must continue their programs beyond the three-year federal grant period. Thus, this report will explore the options for long-term viability in

the context of the opportunities and challenges that exist in the residential and commercial energy efficiency retrofit market, specifically in the Southeast.

Genesis of Report

The author of this report first began working on this research as SEEA's summer intern in 2011. Her task was to research existing and emerging business plans that the local energy alliances could potentially adopt in order to expand the market for energy efficiency retrofits over the long-term. The result of the internship was a guidebook that she co-authored with Glenn Barnes, Senior Project Director at UNC-Chapel Hill's Environmental Finance Center called: *The Future of Better Buildings Neighborhood Program's Local Energy Alliances: Guidebook for Financial Sustainability Post-ARRA Funding*. The guidebook, referenced throughout the report and annotated in the Appendix, includes traditional fee-for-services business models as well as partnership opportunities that will ensure the long-term viability of SEEA's local energy alliances. SEEA used the guidebook as a training tool for their local energy alliance program managers at their annual conference in March 2012. This report goes a step further than the guidebook by researching the broader energy efficiency retrofit industry to provide a more nuanced recommendation to SEEA that considers both the current and future challenges that threaten the local energy alliance's success.

Definitions

As a common starting point, this report will break down the phrases "energy efficiency" and "retrofit projects" in turn, before delving into the specifics of the federally funded programs in question. The term "energy efficiency" is a broad term that incorporates the concept of doing more with less. It is similar, but not identical, to conservation, which

simply refers to consuming less energy. Nevertheless, the two terms are often used interchangeably, as they go hand-in-hand.

The concept of energy efficiency is not new, however, it is ripe for a rebirth as a cornerstone of energy policy and practice. Several decades ago, Amory Lovins, a thought-leader in environmental and energy issues, coined the term "negawatt" as a way to conceptualize an "unneeded megawatt due to efficiency gains" as an energy resource, not as a cost.[ii] In a climate of increasing concern with the environmental impacts of energy consumption, security of fuel sources and rising energy costs, the negawatts associated with energy efficiency are now seen as the cheapest, fastest and easiest solution to address these issues. Identifying the opportunities for negawatts throughout the energy value chain is the most logical way to begin to rein in the environmental, economic, and geopolitical costs and risks associated with the present day quagmire of balancing these concerns. This report will discuss these opportunities in more detail in the next section.

The term "retrofit" refers to upgrading existing building structures to be more energy efficient. In the context of this report, "retrofit" or "energy upgrade" will refer to the residential and commercial sectors of the economy. This includes homes, multi-family housing units, and small and medium-sized businesses. While the type of building may vary, retrofits are typically targeting similar problem areas to improve energy efficiency. To begin, the building will need to be assessed by a professional energy auditor to identify these problem areas, which tend to be areas where air leaks are most common:

the crawlspace, attic, around windows, doors and electrical outlets. Retrofit projects typically include: sealing air ducts, installing new and more efficient HVAC heating and cooling systems, replacing attic insulation, installing new windows, replacing appliances and lighting with more efficient models. Merely replacing an HVAC system without considering the losses through a home's attic, however, will not capture the potential savings that the new HVAC system offers. Thus, the whole-home or building-envelope approach is the preferred method both from an energy savings and environmental benefits perspective. A "whole-home retrofit" will first analyze the building's theoretical potential for energy savings and then implement several of these projects to maximize energy savings. A whole-home energy retrofit can typically reduce a home or buildings energy needs by 15-30 percent. While the Department of Energy (DOE) and Environmental Protection Agency (EPA) have been successful at launching public-private partnerships for energy efficient appliances through the Energy STAR program, both agencies are still working to identify best practices and incentives for whole-home energy retrofits.

Economic and Environmental Opportunities of Energy Efficiency Investments

The opportunities for efficiency gains can be realized at all points throughout the energy value chain. Current literature on this topic points to end-use energy gains in the industrial, commercial, residential and transportation sectors. According to Lawrence Livermore National Lab's Energy Flowchart[iii] released in 2011, roughly 55 percent of the primary energy inputs in the United States are lost through the process of generation or refining, transmission, distribution and end-use (Figure 1). "End-users," defined by transportation, industrial, commercial and residential sectors of the economy, are responsible for over half of the system loses. Incentivizing energy retrofits for home and

building owners, combined with behavioral changes for energy conservation will have upstream impacts that ultimately reduce the primary energy needs of the U.S.

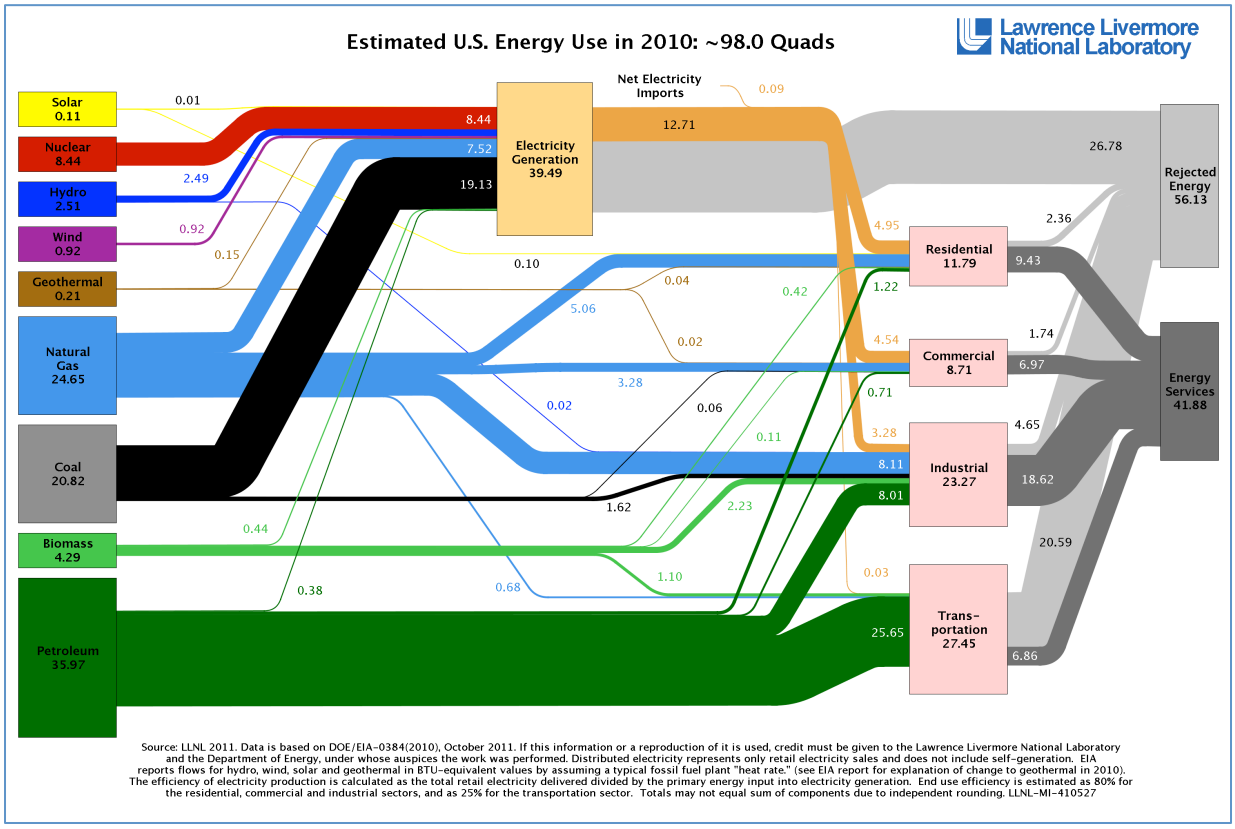

Figure 1: Lawrence Berkeley National Lab: Energy Flow Chart, 2011[iv]

Significant economic and environmental benefits are achievable by reducing primary energy needs through end-use energy efficiency measures. A report from McKinsey, a consulting firm, suggests that an aggressive, but feasible energy efficiency program in this country would reduce end-use energy consumption by roughly nine percent by 2020, reducing primary energy needs by about 18 percent. If fully executed, this could potentially save $1.2 trillion and abate 1.1 gigatons of greenhouse gas emissions annually.[v]

Additionally, investing in energy efficiency measures is the most cost-effective strategy for mitigating greenhouse gas (GHG) emissions. McKinsey has done extensive research on this subject and found that around 40 percent of the opportunities for GHG reduction have negative costs, meaning they generate net returns for the investor.[vi] Figure 2 shows that nearly all of the negative cost greenhouse gas abatement strategies are investments in energy efficiency in the residential and commercial sectors. This confirms Amory Lovins' theory that the negawatt should not be thought of as a cost, but rather an opportunity to "profit" through the avoided costs associated from an investment in energy efficiency.

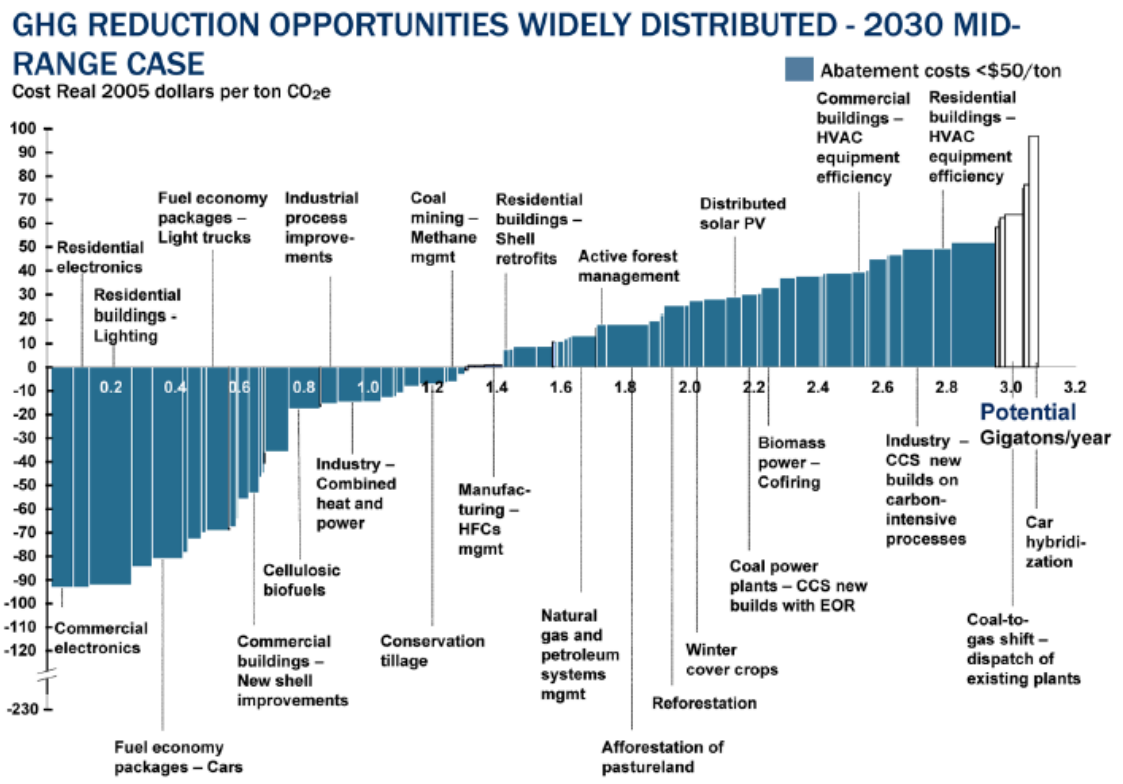

Figure 2: McKinsey's greenhouse gas abatement cost curve[vii]

Likewise, when compared to other energy resources that do not produce GHGs such as solar thermal water heaters, energy efficiency can be thought of as the cheapest energy

"resource." Lazard, an investment bank, has done an extensive study on this topic, calculating the levelized cost of energy (LCOE) for several energy resources. As shown in Figure 3, Lazard concludes that energy efficient technologies are indeed the low-hanging fruit in reducing energy costs.[viii] The LCOE, a common metric for cost comparison, takes into account the overnight capital costs of building a particular plant, fuel costs, operations and maintenance costs and cost of capital for the life of the plant to determine on a dollar per megawatt basis the cost of providing that source of electricity. To investors and building owners alike, this should signal that energy efficiency investments are a "no-brainer" to reducing costs. To policy-makers that are concerned with climate change and reducing greenhouse gas emissions, energy efficiency should be thought of as the most cost-effective way towards achieving carbon neutrality.

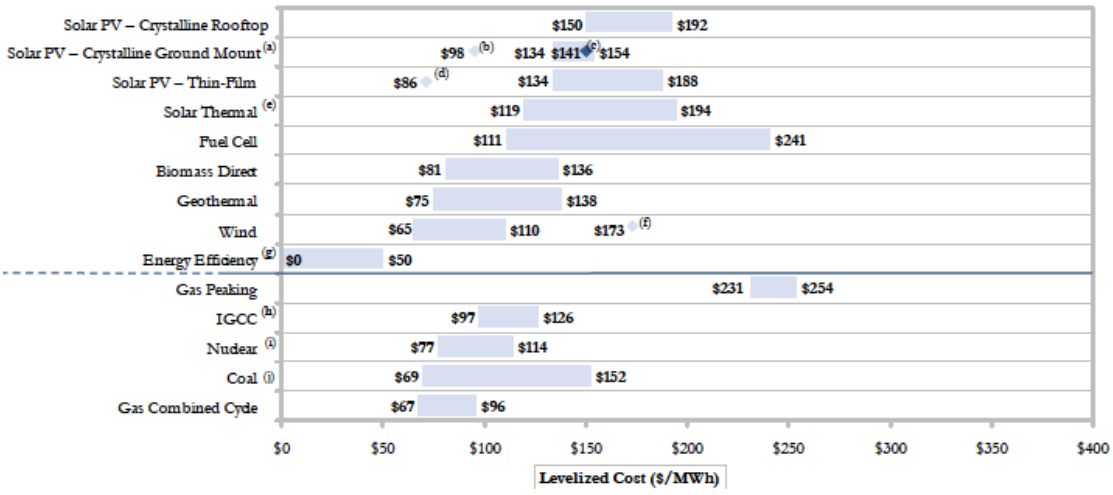

Figure 3: Lazard's Levelized Cost of Energy calculations; Energy efficiency comes in at the least expensive[ix]

Barriers to Energy Efficiency Implementation

If the economic and environmental benefits of energy efficiency investments are as encouraging as the research suggests, then why are more home and building owners not seeking comprehensive energy retrofits? The barriers to implementing energy efficiency

for existing homes and buildings have been widely researched and can be boiled down to three broad categories: knowledge gaps, unclear economics and a lack of regulatory mandates or incentives.

While there is strong research to indicate the potential for environmental and economic benefits of investing in energy efficiency, this information has not been well communicated to the general public. For the population segment that may have heard of the potential benefits, there remains a strong skepticism that the cost savings will justify the investment, as the payback period of some investments can range from a few years to over a decade. Finally, the decision to retrofit a home or building may not be an urgent concern, as many Americans still prefer to invest in aesthetic retrofits that will increase the resale value of the asset.

Modeling energy and costs savings of energy efficiency retrofits is still very much in its infancy. A home or building's theoretical potential for savings may be in the 25-30 percent range; however, energy savings depends on how the individuals behave and interact with their energy usage. The classic Jevons effect in behavioral economic literature points out that as resources become more efficient, the people tends to use them more, thus negating potential net energy savings. A common example of this is purchasing a new Energy STAR refrigerator and keeping the old, inefficient refrigerator in the garage. Furthermore, a complete home or building energy retrofit may costs thousands or tens of thousands of dollars and without a guaranteed payback period, it is

understandable that the risk associated with the return on investment is not a catalyst for this industry.

Finally, public utility commissions around the county have taken limited interest in mandating electric and gas utilities to incentivize their customers to conserve electricity through energy efficiency measures.

The Opportunity and Barriers to Energy Efficiency in the Southeast

The southeastern region of the United States, the "Southeast,"[1] has great potential for energy efficiency gains, however it also faces distinct challenges that have inhibited efficiency investments. The potential in this region is clear: the Southeast consumes the most energy per capita of any other region, as shown in Figure 4, thus has the most to gain from energy efficiency measures.[x] Moreover, in an area with comparatively cheap retail electricity rates, perhaps it is not surprising that the region also has the lowest investment in energy efficiency per capita.[xi] The Southeast also contains some of the fastest growing population centers in the country, putting further pressure on utilities to meet increasing demand for electricity. According to the Federal Energy Regulatory Commission (FERC), electricity consumption in the southeast is projected to grow 45 percent between 2000 and 2020.[xii] The region is ripe for investing in energy efficiency; however, there are distinct barriers that make these investments challenging. These barriers affect the underlying business model of the energy retrofit programs that the Southeast Energy Efficiency Alliance is promoting and are important to highlight before

[1] "Southeast" is defined throughout this report as: Virginia, Tennessee, North Carolina, South

discussing the programmatic challenges that this report will focus on in the following sections.

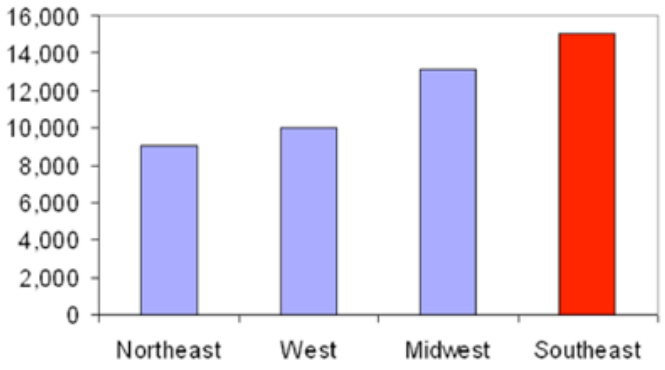

Figure 4: Per Capita Energy Consumption by Region (kWh)[xiii]

In addition to the challenges mentioned in the previous section that relate to energy efficiency retrofits globally, the Southeast had two additional hurdles: cheap electricity and limited decoupling in the electricity markets. The region owes much of its economic development to the availability of cheap electricity rates, however, the lower utility bills in this region increase the payback period on energy efficiency retrofits, thus decreasing the attractiveness of retrofits to a home or building owner. Moreover, electric utility energy efficiency programs tend to be small and poorly marketed in the Southeast. Public utility commissions in the region have mandated that utilities will be compensated for the sale of electricity, thus a utility has little incentive to implement programs that will erode their business model. For the utilities that do offer rebates and other incentive programs for energy efficiency, they have been met with limited demand on the part of ratepayers, likely due to inexpensive electricity prices. In these "chicken-or-egg" scenarios there is a place for public policy to catalyze a behavior or a market until it can thrive on its own. In the next section, this report will discuss the role of the federal government in overcoming the challenges to the energy efficiency retrofit market in the United States.

Government's Role in Energy Efficiency

Since the oil embargo of the 1970s, the U.S. government has taken a strong interest in energy security and alternative energy sources, including energy efficiency, as a means to reduce fuel dependency. In the 1990s, the Environmental Protection Agency (EPA) announced the Energy STAR program, a voluntary public-private partnership initiative to encourage the manufacturing of energy efficient products for the U.S. market. More recently, the American Recovery and Reinvestment Act (ARRA), has invested $90 billion to develop a clean energy economy. The Department of Energy (DOE) received $35.2 billion of these funds to allocate for clean energy investments. Energy efficiency projects received $11 billion, the largest slice of this share, to develop the technologies and programs that will enable the United States to become more energy independent and a leader in clean energy industries. Figure 5 shows the breakdown of the funds allocated to the DOE from ARRA. According to a recent report released by the DOE, energy efficiency is referenced as a key component of the government's strategy that will secure the country's competitiveness.[xiv]

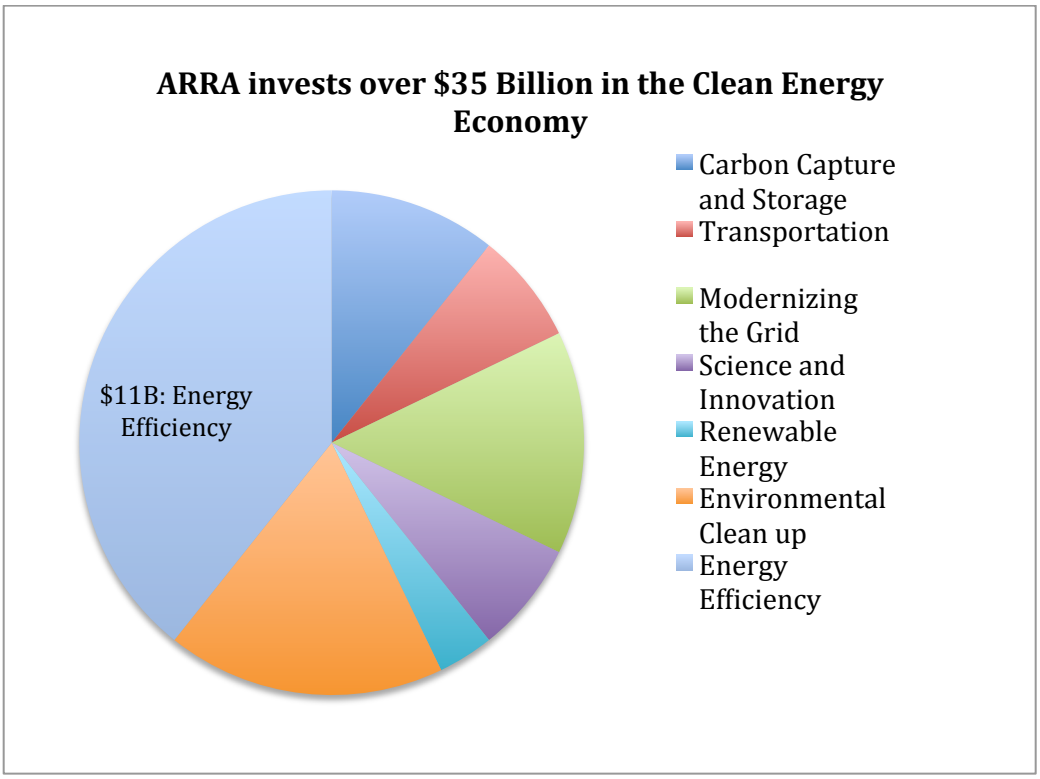

Figure 5: DOE recovery awards through ARRA, $11 billion allocated for energy efficiency[xv]

DOE's Better Buildings Neighborhood Program

One of the several initiatives that DOE launched to invest in the clean energy economy was the Better Buildings Neighborhood Program (BBP). In 2009, DOE allocated $508 million to create the BBP, a competitive grant program, with the goal of driving a market transformation for energy efficiency in the U.S.[xvi] The grant funding was meant to spur a private market for energy efficiency in homes and buildings by leveraging private capital, creating jobs, and producing energy savings between 15-30 percent.

Vice President Joe Biden announced the program in response to the recommendations proposed by the White House Council on Environmental Quality (CEQ). The CEQ report, "Recovery through Retrofit," outlined key barriers to scaling energy efficiency

upgrades in the U.S. including: access to information, access to financing and access to skilled workers.[xvii] The Better Buildings Neighborhood Program seeks to overcome these barriers by partnering with 41 programs around the country to experiment and determine best practices for effective models of retrofit programs. Figure 6 shows a map of these partner programs, which include municipalities, non-profit organizations and private businesses. Funding for the partner programs comes primarily from the Energy Efficiency and Conservation Block Grant (EECBG) Program and the State Energy Program (SEP), which have contributed $482 million and $26 million to BBP, respectively.[xviii]

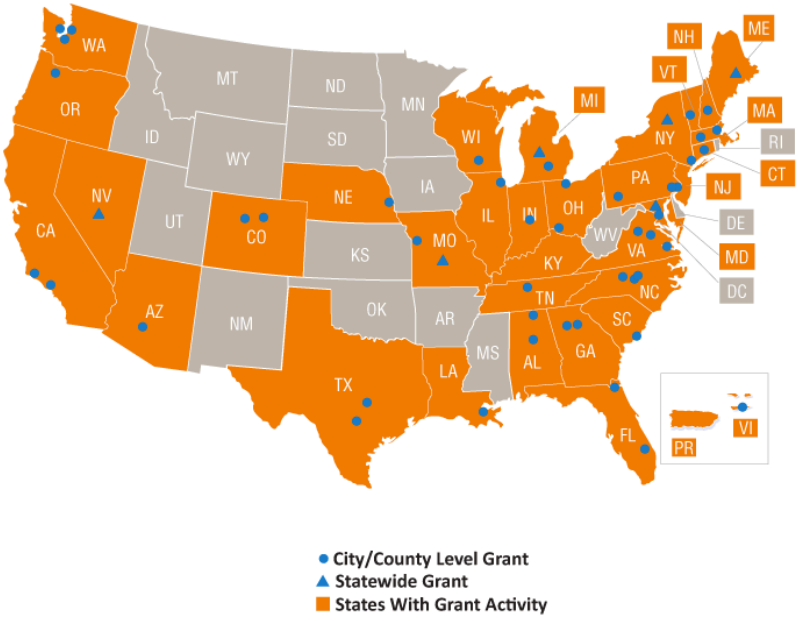

Figure 6: Better Buildings Neighborhood Program: 41 partners around the United States[xix]

BBP's main purpose is to develop long-lasting energy efficiency retrofit programs using federal dollars as seed-capital for these organizations and businesses to thrive. By 2013, the program's goal is to upgrade more than 100,000 homes and buildings, achieving 15-30 percent energy savings. This should save consumers about $65 million per year on

energy bills. Figure 7 shows the six major goals of the BBP that drive its central mission to create a robust energy efficiency retrofit industry in the United States. The next section of this report will introduce the Southeast Energy Efficiency Alliance (SEEA), a grant recipient of the BBP. The rest of this report will focus on SEEA and their unique challenges to accomplish the BBP goals while planning for the long-term viability of their programs beyond federal grant funding.

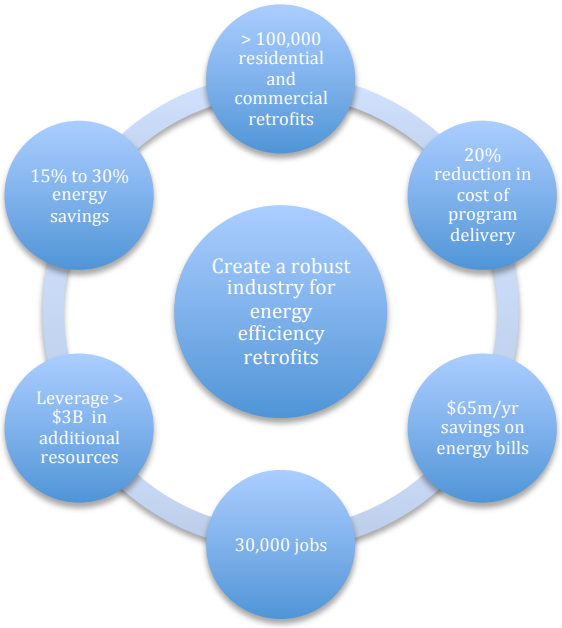

Figure 7: Better Buildings Neighborhood Program goals [xx]

Southeast Energy Efficiency Alliance

The Southeast Energy Efficiency Alliance (SEEA) was incorporated as a 501-(c)(3) in 2007 to promote energy efficiency programs and policies in the southeastern region of the U.S. Headquartered in Atlanta, GA, SEEA is a subsidiary of the Alliance to Save Energy, based in Washington, D.C. SEEA's mission is to "promote energy efficiency for

a cleaner environment, a more prosperous economy and a higher quality of life in the Southeastern region of the US."[xxi] It has set four major goals to achieve these results:

- Position energy efficiency as a viable tool for strengthening the regional economy and protecting the environment.
- Promote energy efficiency to increase electric reliability.
- Empower consumers at all income levels through education on the benefits of energy efficiency, including energy savings and quality of life.
- Promote the development of a vibrant energy services industry throughout the Southeast, and growing markets for energy efficient products.[xxii]

SEEA is Awarded BBP Grant Funding

Given the BBP goals mentioned above, SEEA was well positioned to apply for and be awarded a $20 million grant from the Better Buildings Neighborhood Program to build or expand thirteen separate energy efficiency retrofit programs in eight southeastern states and the U.S. Virgin Islands. Figures 8 shows the geographic range of programs throughout the region. SEEA has branded the thirteen programs under the name SEEA WISE (Worthwhile Investments Save Energy), although many programs have created their own logo to promote their individual programs.[xxiii] The term "local energy alliance" or "LEA" has been used to describe these programs in the SEEA network and more generally in the Better Buildings Neighborhood Program.

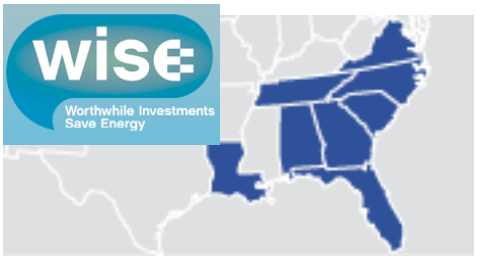

Figure 8: SEEA grant distribution funds to Local Energy Alliances (LEAs) in the blue shaded states (does not include Virgin Islands)[xxiv]

SEEA's role as the administrator for the BBP is to provide resources for program design, implementation, workforce development and technical support to the LEAs so that each program contributes towards the overarching BBP goals. SEEA's thirteen programs have set a goal to complete approximately 10,000 home and building energy retrofits over the three-year grant period, or by 2013.[xxv] SEEA seeks to foster each local energy alliance's success in transforming the market for energy efficiency in the southeast, as well as pave the way for sustainable funding sources for these programs beyond the BBP grant period.

Each local energy alliance in SEEA's portfolio has pursued a unique program design in their first year and has experimented with various rebate and incentive programs. From neighborhood energy challenges to free smart-meters that provide real-time data to homeowners, LEAs have tried several methods to engage their communities. LEAs so far have emerged as community-based nonprofit organizations, as well as spin offs of local mayor's offices, city council initiatives, or even utility programs. SEEA's ultimate vision, however, is that the programs converge towards a more streamlined not-for-profit, "local energy alliance" model. This LEA model, as a 501-(c)(3), will remain true to its mission to drive a private market for energy efficiency and meet the stated energy savings goals in compliance with the Better Buildings Neighborhood Program. However, as a nonprofit

organization, the LEA will have the flexibility of raising capital through a variety of sources to achieve this goal. A local energy alliance may utilize traditional business models to generate revenue, partner with local utilities to administer energy efficiency programs, and/or raise capital from local, state and federal government, as well as through private foundation grants. The next section of this report will explain the role of a local energy alliance and then outline options and guiding questions for LEAs to consider in determining the long-term financial sustainability strategy of their organization.

The Role of the Local Energy Alliance

Energy efficiency, like other energy resources, can be broken into global and local challenges. Globally, energy efficiency can benefit from the economies of scale that come with technological innovation, financing mechanisms and program design. The result of this global effort to enable energy efficiency requires a LEA to utilize and adapt tools for on-the-ground implementation. No two communities are alike, thus, a LEA is the best-suited entity to design customized programs given a standardized set of tools that will meet the needs of the local community. A LEA's role may be different in every community, but can range from energy efficiency retrofit program design, implementation, financing, quality assurance and control, monitoring and evaluation, and ancillary services such as energy efficiency education, workforce development and advocacy for more attractive retrofit policy tools.

In defining its value proposition to home and building owners and contractors, the local energy alliance should identify opportunities to leverage capital and generate revenues to sustain costs and grow the program over time. A LEA's core competencies can be broken

into five main categories that will be described in turn in Table 1 below: 1) Education Outreach and Contractor Training; 2) "Bridging the Gap"; 3) Partnerships with Financial Services; 4) Quality Assurance and Quality Control; and 5) Advocates for Local and State Policies that Enable Energy Efficiency. Each of these core functions contributes to expanding the market for energy upgrades and generating revenue to sustain its mission. Together, these roles give the LEA an advantage over a traditional utility-run energy efficiency program in that many ratepayers typically do not view their service provider as an ally in reducing electricity needs. Likewise, utilities may not be equipped to manage a robust energy efficiency program since it is not core to their business.

1) Education Outreach and Contractor Training	In markets where the benefits of energy efficiency are not well known, a LEA's first objective is to inform homeowners and building owners about the benefits of energy efficiency and how to overcome the perceived barriers to energy upgrades. Through education and outreach on these issues, the LEA helps to drive demand for energy efficiency retrofits. Some of these benefits that the LEA may highlight are the long-term dollar savings from a more energy efficient home or building, the human health benefits from improved indoor air quality and environmental impacts of reduced greenhouse gas emissions. Additionally, a LEA plays an important role in creating a qualified or certified workforce for home and building energy improvements. By partnering with local universities, certification associations, or by hosting internal training or certification programs, a LEA will ensure that there is an adequately trained workforce to meet a growing demand for energy efficiency upgrades.
2) "Bridging the Gap"	In driving demand for energy upgrades and securing a qualified workforce, a LEA also plays an important role in bridging the gap between home/building owners and home performance contractors by facilitating the interaction of these two parties. A LEA helps home and building owners take the hassle out of finding a qualified contractor by prescreening and approving contractors in their network. Additionally, the LEA walks customers through the process and streamlines paperwork to receive rebates and other incentives. They serve as a "one-stop shop" for home and commercial building energy upgrades with a focus on customer service. The LEA's network of contractors have been certified, receive on-going training and other additional support to ensure that customers receive high-quality service and maximum efficiency gains for their homes or buildings. A LEA's business model may even tie their revenue to the savings provided to their costumers. For contractors, the LEA is a strong ally as it generates job leads through its marketing efforts and attractive rebates and incentives.
3) Partnerships with Financial Services Companies	Removing the upfront cost barrier is a vital component of a LEA's niche and key to its long-term success. Rebates and incentives will typically not cover the full costs of a complete home or building upgrade, thus the LEA will need to offer a suite of financing options to meet the needs of a diverse customer base. By partnering with credit unions, private banks, municipal or self-managed revolving loan funds, a LEA will be able to negotiate the best loan terms for their clients. Additionally, a LEA may employ mechanisms such as a loan loss reserve or an interest rate buy down to lower the cost of capital. When attractive loan products and incentives are available, the contractor may have more opportunity to sell customers additional "green" products, such as rooftop solar or geothermal heat pumps. Alternatively, a LEA with greater access to capital may chose a business model that provides the upfront investment costs of the energy upgrade and reaps the benefits for a period while lowering the energy bills for home/building owner, similar to an Energy Services Company (ESCo) model.
4) Quality Assurance/Quality Control (QA/QC)	A LEA may guarantee quality assurance and quality control for home and building owners, which will ensure that energy upgrades have been completed to the highest standards and meet projected energy savings. The LEA may also offer one hundred percent customer satisfaction and have sanctions in place for network contractors that do not comply with contract agreements. These policies will strengthen customer trust and brand image for the LEA, as well as provide the metrics to account for actual verses estimated energy savings.
5) Advocates for Local, State and Federal Policies that Enable Energy Efficiency	A LEA will advocate for policies that will create standards for building retrofits, establish common metrics for determining energy savings and push for mandatory certifications for home performance contractors. These policies may include: tax credits, rebates or other incentives

Table 1: Core Competencies of a Local Energy Alliance

Snapshot: Local Energy Alliance Case Study:

Figure 9 shows a screenshot of the Local Energy Alliance Program (LEAP) in Charlottesville, Virginia. From LEAP's homepage, a homeowner can quickly access resources to learn about the benefits of home energy retrofits, what to expect throughout the process and rough estimates of the long-term savings potential from energy efficiency upgrades. A full description of the rebates and other incentives for customers is also available here. Behind the scenes, LEAP has already established a network of qualified contractors. Additionally, they provide continual training programs to ensure that customers receive high-quality energy upgrades with measurable savings. Finally, LEAP has arranged a loan loss reserve guarantee or an interest rate buy-down with local financial institutions to provide LEAP customers with the lowest interest rate available on loans for home energy improvements.

Figure 9: Example of a SEEA LEA: Charlottesville, VA's Local Energy Alliance Program (LEAP)[xxvi]

The Challenge of the Local Energy Alliance

LEAs in the Better Buildings Neighborhood Program, including the thirteen in SEEA's, network, have set forth ambitious short and long-term goals that are at odds with one another. The BBP grants have a three-year time frame to complete 100,000 retrofits that produce 15-30 percent energy savings per retrofit, while at the same time setting the foundation for the sustainable growth of a private energy efficiency retrofit market. Local energy alliances in SEEA's portfolio and around the country, however, currently have no

defined vision for how to fund or sustain their retrofit programs beyond the BBP grant period, which is set to expire in September of 2013. There appears to be political pressure to "get the money out the door" in order to quantify retrofit jobs and capital deployed. This approach directly threatens the long-term vision of the program. The challenge of the local energy alliance is to achieve both short-term retrofit goals and long-term market transformation of this industry. The Better Buildings Neighborhood Program appears to only be supporting the former.

The Better Buildings Neighborhood Program and SEEA are equipped to provide technical assistance for the local energy alliances, as well as basic tools and resources for driving consumer demand, financing projects and training contractors in whole-home energy efficiency measures; however, they are lacking a clear roadmap for LEAs to plan for the long-term viability of their program after the grant period expiries. Many LEAs have experimented with various fee structures to help offset overhead costs, testing their pricing strategies to determine their market value. This practice was brought to a halt in late 2011 however, when the DOE announced that BBP grant recipients would not be permitted to offset program costs by implementing fees on contractors or home and building owners during the grant period. While this imposes a challenge for programs trying to establish their market value, there is still an opportunity for a program to propose a fee structure that will be approved upon review by the DOE in the last six months of the grant period. When the BBP grant funding expires, the local energy alliances will once again be able to implement a fee structure, however, re-establishing

this value may prove to be difficult, since contractors and homeowners will by then be accustomed to a subsidized market.

The next section of this report will outline various options for local energy alliance program managers to consider now, so that by the end of 2013 they will be prepared to continue their services without relying on federal funding.

Pathways for Local Energy Alliances to Thrive Post-Grant Funding

When the BBP grant funding expires in the third quarter of 2013, LEAs around the country will cease to exist if they do not have a plan in place to fund future operations. LEAs should treat the grant as seed capital to launch a full-fledged program with diverse funding and revenue streams. To thrive in a post-ARRA world, LEAs will need to seek partnerships with utilities, local governments and private entities to grow its capital pools for rebates and incentives. Innovative financing mechanisms such as revolving loan funds and on-bill financing are critical for expanding access to energy retrofits. Additionally, a LEA must adopt an earned revenue strategy to offset overhead and administrative costs by implementing a fee-for-service business model. In choosing a diverse funding and earned revenue strategy, a LEA mitigates the risk of closing its doors and ensures its ability to drive a local market for energy efficiency retrofits. This section will give a brief synopsis of the guidebook created for SEEA in March 2012, which defines these options in three broad categories to be discussed in turn: Earned Revenue, Contract Services and Innovative Financing Tools.[xxvii] Experimentation with these strategies now may ultimately shape the business model and path forward for the LEA post-ARRA funding.

Table 2: Pathways for Local Energy Alliances post-ARRA funding

	I. Earned Revenue	*II. Contract Services*	*III. Innovative Financing Tools*
Overview	Earned revenue strategies through "fee-for-service" business models.	Revenue earned through contracts to administer and implement energy efficiency programs.	Tools that the LEA can implement to make loan products more attractive to potential customers, thus enhancing the effectiveness of the LEA.
Long-term viability potential for the LEA	The LEA streamlines paperwork between the contractor and the homeowner, making the experience hassle-free. In return, the LEA takes a cut to grow their rebate program.	The LEA is contracted by a municipality or a utility to serve as a third-party administrator and implementation partner and uses 3rd party funds to run the program. The LEA charges for this service to cover their overhead, labor costs and/or to scale the business.	The LEA does not generate revenue with these tools; however, they will allow the LEA to offer rebates in addition to attractive loan options for home energy upgrades.
Considerations for the LEA	Is there enough demand from both homeowners and contractors to warrant this business model?	Given the competition from professional consulting firms with this expertise, does the LEA have enough credibility to leverage these contracts?	How strong is the utility buy-in and/or local government's commitment towards incentivizing energy efficiency upgrades?

I. Earned Revenue

Currently, local energy alliances in SEEA's network are only utilizing the BBP grant money to pay for their rebate and incentive programs. Going forward, a LEA may choose to adopt a fee-for-service business model approach to help offset their overhead costs, while maintaining their status as a not-for-profit organization. In providing a valuable

service to both homeowners and contractors, the LEA can charge a reasonable fee for their products and services, as well as for the expertise they provide to both parties. This section will summarize common examples for earned revenue business models. A description of the advantages, disadvantages and considerations of each business model can be found in Appendix A.

Contractor/Vendor Fees

Contractor or vender fees are one of the most straightforward ways for a LEA to generate revenue in exchange for a value-added service. In setting up a contractor fee, regardless of the structure, it is important to highlight the benefits to the contractors of being a member of the LEA network. Two common examples of these fees are: 1) annual or monthly membership fees; and 2) percentage override or flat fees.

1) *Annual or monthly membership fee*

A membership fee is charged to the contractor to be a part of the LEA network. This could range from a couple hundred dollars to several thousand dollars per year, depending on the benefits and/or services the contractor receives from the LEA. Fees could be used to help offset the LEA's cost of marketing and outreach, costs to provide quality assurance and/or quality control (QA/QC), or to help cover program administration costs. Benefits to highlight for contractors may include: customer leads through LEA marketing initiatives, free or reduced cost of trainings and certifications, access to reduced cost IT tools, and other on-going benefits. Each LEA will have to experiment to determine a fee structure that works for the program.

2) *Percentage override or flat fee*

A percentage override or a flat fee is an additional charge to contractors on total retrofit project cost. For a percentage override fee, this could be anywhere between two to five percent of the total project cost, with a logical cap after a job reaches a certain size, or around $10,000. Some programs may have a tiered rate structure depending on who generates the lead and others may charge the same percentage or flat fee regardless of job origination. This fee mechanism can be used in combination with other fees such as a contractor membership fee or a homeowner/owner's agent fee. Stressing to the contractors the benefits of participating in the LEA program will be critical to the successful implementation of this fee.

Homeowners/Owner's Agent Fees

There are several types of fees that a homeowner or building owner could be charged, however, fees need to be reasonable and there must be highly perceived benefit. For simplicity, several of the fees outlined below could be bundled together into an "administrative fee" in their residential or commercial program. The LEA needs to communicate a clear value to the homeowner or building owner, above and beyond what they might do themselves. Two common examples of these fees are: 1) Audit fees; and 2) Energy Service Advisor fees.

1) *Audit fees*

While giving away free audits may seem like an obvious way to draw homeowners into the LEA program, initial research from the Lawrence Berkeley National Lab (LBNL) indicates that conversion rates from energy audits to energy retrofits are actually higher when the homeowner has paid market rate or close to market rate for a home energy audit.[xxviii] Therefore, it is recommended that the LEA not erode the market value of this service by providing free audits. If the LEA choses to subsidize the audit fee, it should publicize the going market rate for this service, as to not undercut the private energy audit industry.

One option is for the LEA to offer tiered audit services through in-house resources or external providers. For example, a level 1 audit could be a free and simple walk through of the home to identify no or low-cost solutions for energy savings. A level 2 audit could be structured as a comprehensive home energy assessment available at market price with rebates to offset the cost to homeowners. Programs such as RePower Bainbridge in Washington State experimented with this model before the DOE's new regulations were announced that limited BBP grant recipients to solely relying on grant funds.[xxix]

2) *Energy Advisor Service Fee*

An Energy Advisor service (also called an energy coach or energy concierge) can be an effective way to maintain customer satisfaction and increase conversion rates from energy audit to energy retrofit. While the level of services may vary, an energy advisor essentially walks a homeowner or building owner through the entire process: from

explaining the audit recommendations, to offering rebates or financing options, to following up after the job is complete and ensuring satisfaction. This is likely an expensive component of the program and the LEA may decide to charge the homeowner or building owner a fee for this service. The EnergySmart program run by the City of Boulder is one of several programs that offer multiple levels of energy advisor services at different price points.[xxx]

Products and Services for Do-It-Yourself customers

While the goal of a local energy alliance is to drive a private market for energy retrofit contractors, there could also be a substantial market for services offered to homeowners that are interested making their homes more efficient, but prefer to do the labor themselves. Services could include: an energy audit that identifies lowest cost energy savings renovations within a budget, a LEA discount on purchasing supplies, fee to provide QA/QC after the project is complete and to ensure energy savings. Fees for DIYers could help expand the LEA customer base and potentially feed homeowners into the full LEA retrofit program.

II. Contract Services

As a leader of energy efficiency program design and implementation, a LEA may be contracted by either a local government or a utility to administer a comprehensive energy efficiency retrofit program for ratepayers. Investor-owned utilities in the southeast have been reluctant so far to agree to this type of partnership; however, this could change as LEAs throughout the country gain credibility in the marketplace. There also may be opportunities to partner with municipal or rural cooperative utilities that have strong

incentives to promote efficiency. As a third party administrator of these programs, the LEA may charge a small fee to cover overhead costs, while utilizing ratepayer or municipal funds to serve the rebate and incentives program. Building credibility in a market that is dominated by savvy consulting firms already administering similar programs will be critical for the LEA to gain a competitive edge. Appendix B includes a full description including advantages and disadvantages to a contractual services business model.

III. Innovative Financing Tools

Innovative financing tools are not exactly ways for the LEA to generate revenue, however, they are important to the sustainable design of the program. Rebate programs are inherently not maximizing the full potential of grant funding, as they do not leverage the possibility of recycling capital pools more than once. There are a several tools that may make those dollars go further that will be discussed briefly here: revolving loan funds and utility on-bill financing.

Many local energy alliances have created revolving loan funds (RLFs) that give loans specifically for large retrofit projects. They recycle the funds and loan interest to grow the program, which allows more borrowers to tap into the RLF. The grant funding that the LEAs received from the Better Buildings Neighborhood Program should be treated as the seed money to establish a revolving loan fun. Additionally, if the RLF is self-managed, a local energy alliance can charge origination fees, management fees, and interest to the borrower, typically between one and five percent of the loan value. These fees will either go to the financial institution or to the LEA to cover overhead costs. The

local energy alliance may also contribute funds for interest rate buy-downs or credit enhancements such as a loan loss reserve guarantee, which will reduce the ultimate cost of the loan for the borrower.

A utility on-bill financing program allows the home or building owner to take out a loan for an energy efficiency upgrade and then repay that loan on their monthly utility bill. Because the building will save 15-30 percent of their original energy bill due to the retrofit efficiency gains, the loan payments can typically be structured such that the customer does not see an increase in their monthly utility bill. After the loan as been paid off, the customer will capture the full cost-savings benefits associated with lower energy bills. Although this concept appears simple in theory, on-bill financing requires significant coordination and buy-in from the local utility, which may not be suited to serve as a collection agency for energy efficiency loans payments.

Other tools such as Property Assessed Clean Energy (PACE) programs and Qualified Energy Conservation Bonds (QECB) were originally researched for SEEA, however, the complexity of these mechanisms in addition to the level of municipal support was deemed to be infeasible in the Southeast. Appendix C includes a full description of these innovative financing tools.

Feasibility of Pathways for SEEA's Local Energy Alliances in the Context of Current Challenges

To determine the feasibility of the options described in the previous section, this report's author first investigated the current challenges of SEEA's programs before giving the final recommendations for the local energy alliances to remain viable long-term.

In conversations with SEEA's Director of Municipal Energy Efficiency Programs while working as their summer intern in 2011, it became clear that about halfway through the three-year grant period, the local energy alliances in SEEA's network were falling short of meeting their collective goals. The benchmarks in Table 3 show that, as a whole, local energy alliances in SEEA's network had achieved less than one tenth of their goal to complete 10,000 retrofits by the end of 2013. A few LEAs had even discontinued their relationship with SEEA and the BBP due to limited program success. Additionally, the energy savings from retrofit projects are no longer being tracked, since this was deemed by the DOE to be challenging and often inaccurately measured. Furthermore, none of the programs had any additional revenue streams or sustainable funding sources beyond the BBP grant funding.

	SEEA Goals by 2013:	**SEEA Results, as of late 2011*:**
Retrofits completed	10,000	<1,000
Energy savings	15-30%	Stopped keeping track
Self-sustaining programs	100%	0%

Table 3: SEEA Program Benchmarks **** For confidentiality reasons, this report will not give specifics on SEEA program statistics***

Despite these red flags, the Better Buildings Neighborhood Program website shows that SEEA is on track with its finance, workforce and marketing milestone goals.[2] These goals are nebulously described and quantified publically with a "check," rather than a transparent status report on each grant recipient (see Figure 10).[xxxi] After months of research, it became clear to this report's author that the long-term goals of the Better Buildings Neighborhood Program to foster a viable market for energy efficiency retrofits were secondary to demonstrating short-term benchmark goals.

				Finance Milestones		Workforce Milestones		Marketing Milestones		
	Award Announced	Award Period Begins	Program Launched	Partnership Agreement with Financial Institution	Consumer Financing Available	Contractor Requirements Finalized	Contractor(s) on Board	Marketing Professional(s) Engaged	Consumer Marketing Started	Website Launched
Rutland County, Vermont	✓	✓	✓		✓	✓	✓	✓	✓	✓
San Antonio, Texas	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Santa Barbara County, California	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Seattle, Washington	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Southeast Community Consortium	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
St. Lucie County, Florida	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Toledo, Ohio	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Figure 10: Milestones for grant recipients of the Better Buildings Neighborhood Program[xxxii]

At a conference held in June 2011 for local energy alliance program managers in SEEA's network, many voiced a strong concern for insufficient demand in their communities for whole-home or building retrofit jobs. While most customers would be willing to take a rebate to replace their old refrigerator with a more energy efficient model, few are inclined to borrow money to make an investment for a comprehensive energy retrofit for their home or building.

[2] DOE website has labeled SEEA here as the "Southeast Community Consortium," an outdated name

In lieu of high demand for whole-home energy upgrades, SEEA's local energy alliances have independently responded by taking a "build it and they will come" approach to their programs design. Many have gone to great lengths to partner with financial institutions to create loan products with complicated loan loss reserve or interest rate buy down contracts. These loan packages are difficult to establish, as the risks are not straightforward and the market is not well understood. Furthermore, the loan enables the borrower to achieve energy "savings" rather than a tangible asset such as a car or a solar panel, which can be salvaged in the event of loan default. The combined effect of these factors has led to limited success in partnering with financial institutions for energy efficiency loan products.

Additionally, local energy alliances are too focused on building out qualified contractor networks, and have overlooked the importance their downstream market – home and building owners in the market for energy efficiency retrofits. While it is important that contractors are trained in the science of whole-home energy upgrades, this serves no purpose if the demand for these services does not exist. Furthermore, contractors will seek the qualifications without subsidy, if the market indicates this need. Despite the local energy alliance's best efforts to alleviate the barriers to energy efficiency adoption rates, the barriers in this market, as mentioned above, have inhibited the success of SEEA's programs.

The challenges that SEEA faces, thus, are more complex than simply addressing how each local energy alliance will survive post-BBP grant funding. Without sufficient demand for energy efficiency retrofits in their regions, the local energy alliances will have no market to serve and no reason to continue long-term. One exit strategy may be for LEAs to allocate all of their grant funding in the form of rebates and cease to exist after 2013. While this outcome is not optimal, for many LEAs it might become a reality. The next section of this report will conclude with recommended strategies for SEEA and its local energy alliances to be well positioned for both short and long-term success.

Recommendations to SEEA

In the dozens of interviews conducted for this research report, not one program manager in the SEEA network could completely answer the question, "How will you keep the local energy alliance in operation after 2013?" Most of the conversations were dominated by concerns over generating demand in the short-term and meeting the yearly targets that each LEA has set in accordance with SEEA's mandate. Thus, the final recommendations for SEEA are two-fold: refocus the program design now to educate the public about energy efficiency and implement long-term strategies to ensure program success post federal funding.

Recommendation 1: *Start with the basics*

As highlighted above, the "build it and they will come" model is an important component of creating an infrastructure to support a retrofit market, but getting over the knowledge gap, appears to be a more fundamental threat to the success of local energy alliances. By

allocating more time and resources into consumer outreach and education, the local energy alliances in SEEA's network can effectively drive demand for retrofits, while allowing private contractors and financial institutions to do the heavy lifting once the market is ready.

Educating consumers on the benefits of these investments and helping them understand the true savings potential is less costly and a more effective use of the LEAs resources at such an early stage in the Southeast's retrofit market. In the *Role of the Local Energy Alliance* section, this report discussed education and public outreach as a core function of the LEAs niche in this market. A return to this basic role is needed to build an interest for home and building energy retrofits. As demand for energy efficiency picks up, the LEA can transition into leveraging more partnerships with financial institutions and contractor networks. By starting with the basics of generating demand, LEAs will be well positioned to mature with the growing needs of the energy efficiency retrofit market.

Recommendation 2*: Utilize the long-term viability options now for a smooth transition into program autonomy*

In the year and a half that the local energy alliances have remaining in the Better Buildings Program, LEA managers should begin market feasibility studies to determine which fee structures may work for their particular community. The DOE has approved the local energy alliances to implement fees in their programs up to six months before the grant period, which allows time for the LEA to true up their pricing strategy of a fee-for-service business model. By commanding a fee for their services, the LEA demonstrates

its added value and increases the likelihood of partnerships with utilities, local governments and financial institutions. Additionally, local energy alliances should be making a concerted effort to engage with the local utilities and municipal leaders now to discuss the possibility of contracted services or other partnerships. Having these conversations now will allow the LEAs to scale their efforts to sustain a retrofit market in their community. To ensure a smooth transition into autonomy in 2013, SEEA's local energy alliances should experiment now, while they have the BBP support, with the various business plan options and tools outlined in this report.

Conclusions

For a $508 million experiment to discover innovative business models that will have lasting impact on the energy efficiency retrofit market, the Better Buildings Neighborhood Program has been successful in supporting an industry of entrepreneurs that are, as a whole, helping to improve the clean energy economy. As the only grant recipient in the Southeast, SEEA has forged ahead with experimental program designs, allowing local energy alliances to determine best practices in this region. It is time now, however, that SEEA give more guidance to the local energy alliances to help program managers focus on the basics of driving demand for energy efficiency while navigating the barriers that have traditionally impeded this region's investment in home and building retrofits.

It is not surprising that some LEAs have fallen out of the SEEA network and that others may also fail to establish a successful program beyond 2013. The Better Buildings

Neighborhood Program is aware of these high stakes and perhaps has allocated only a small percentage of the total DOE funding to this endeavor for that reason. It is important, however, that the BBP administrators and SEEA capture the lessons learned from program failures and incorporate those changes into their new program initiatives. This report therefore recommends that the LEAs make this midway programmatic shift that focuses on educating consumers and creating the *need* for the ancillary services that support the retrofit industry, rather than creating these services themselves. This combination will bring the clean energy jobs and economic impact that the BBP and SEEA envision.

Additionally, without the foresight to experiment with more meaningful business models during this period of complete subsidization by the federal government, the local energy alliances will have limited chance of future success. It is prudent that the LEA program managers dedicate time and resources over the coming months to determine the feasibility of the options laid out in this report (and in Appendices A-C) in order to set the foundation for continued growth and to achieve their long-term goals in the region.

The Southeast Energy Efficiency Alliance has the unique opportunity to impact the Southeast's energy consumption by scaling best practices for energy efficiency retrofit program design and implementation. As a first-mover in this market, SEEA is learning by trial and error to find viable solutions with real impact to save money through energy savings, create jobs and importantly: foster a growth market for energy efficiency retrofits. By adopting the recommendations described in this report, the Southeast Energy

Efficiency Alliance the their local energy alliances will be well prepared to meet these goals and create a cleaner, safer, more efficient environment for the entire Southeast.

Glossary of Acronyms

ARRA: American Recovery and Reinvestment Act
BBP: Better Buildings Program
DOE: Department of Energy
DIY: Do It Yourself
EECBG: Energy Efficiency Conservation Block Grant
ESCo: Energy Services Company
EPA: Environmental Protection Agency
FERC: Federal Energy Regulatory Commission
GHG: Greenhouse gas
LBNL: Lawrence Berkeley National Lab
LCOE: Levelized cost of energy or electricity
LEA: Local Energy Alliance
LEAP: Local Energy Alliance Program
LLR: Loan Loss Reserve
PACE: Property Assessed Clean Energy
PBC: Public Benefits Charge
PUC: Public Utility Commission
QA/QC: Quality Assurance and Quality Control
REC: Renewable Energy Credit
RLF: Revolving Loan Fund
SBC: System Benefit Charge
SEEA: Southeast Energy Efficiency Alliance
QECB: Qualified Energy Conservation Bond
WISE: Worthwhile Investments Save Energy

Appendix

Appendix A: Earned Revenue

Selected excerpts from *The Future of Better Buildings Neighborhood Program's Local Energy Alliances: Guidebook for Financial Sustainability Post-ARRA Funding*. Written by Kathleen Fraser and Glenn Barnes (Environmental Finance Center):

Contractor/Vendor Fees:

Annual or monthly membership fee

Advantages	*Disadvantages*
• Relatively simple to implement and collect • Fee could be set up as a flat or sliding fee depending on the work volume per contractor • Contractors are more committed to LEA program if they are a paying member • Strong value proposition for the contractor if benefits are properly marketed • Can offset LEA program/administrative costs • Sustainable source of revenue	• Difficult to determine the price threshold • May deter contractors from being part of LEA network • Difficult to estimate revenue from this fee structure, especially as the program is ramping up and may experience inconsistent growth rates and contractor participation

Guiding Questions
• Do contractors perceive valuable benefits from being a part of the LEA network? What does the LEA offer in exchange for membership fees? • What barriers may exist for contractors that would make them unwilling to pay a membership fee? • Can the LEA sustain the benefits to contractor membership?

Percentage override or flat fee

Advantages	*Disadvantages*
• Relatively simple to structure and implement • Contractors likely to approve of fee if benefits of program are properly marketed and demonstrated • Can offset LEA program and administrative costs • If passed on to building owner, it can be rolled into the financing, which streamlines payment • Sustainable source of revenue	• Some contractors may dispute or not approve of the percentage override • May be difficult to collect from contractors unless it is deducted from the contractor rebate that the LEA provides • Difficult to estimate revenue from this fee structure, especially as the program is ramping up and may experience inconsistent growth rates

Guiding Questions
• Does the LEA generate more leads for contractors or vice versa? • What is the percentage or flat fee threshold price for contractors?

• What types of fees do contractors pay to be a part of other networks that generate leads? • Are there any other financial transactions that take place between the LEA and the contractor to facilitate the payment of this fee?

Homeowners/Owner's Agent Fees

Audit fee, external or in-house

Advantages	*Disadvantages*
• Works to correct consumer perception that the audit should come for free • Helps private sector auditors to maintain living wage if programs resist giving audits away for free • Proven to be more effective for conversion rates	• May push some target markets away from program that potentially would have followed through with retrofit (although overall, homeowner buy-in is more successful for retrofits)

Guiding Questions
• What is the market rate of a home energy audit in the LEA's region? • Are there opportunities for the utility partnerships to lower the cost of the audits for homeowners via rebates? • Would an in-house audit service compete with the private sector or fill a market gap while also generating revenue for the LEA?

Energy Advisor Service Fee

Advantages	*Disadvantages*
• Higher audit to retrofit conversion rates with this service • Potential to provide a higher level of customer satisfaction with program • Simplifies process for the homeowner	• Expensive to offer this service, fee alone may not be enough to cover the true cost of an energy advisor

Guiding Questions
• How savvy are contractors at "selling" their services to homeowners and explaining the benefits of whole-home approach to energy efficiency? • Can contractors be trained in customer relations or is it more cost effective to bring along an energy advisor? • What are the major barriers for homeowners not going through with retrofits and how can an energy advisor overcome those barriers in a cost effective manner?

Overview of EnergySmart, City of Boulder, Energy Advisor role and fees: http://www.energysmartyes.com (accessed August, 2011)

What will my Energy Advisor do for me?

Your **Energy Advisor** is your personal assistant, helping you every step of the way. Your advisor will:

- install quick energy-saving items such as light bulbs, water-saving showerheads and insulation for your water pipes.
- review your **EnergySmart Recommendations** with you and help make a plan to reach your comfort or energy-saving goals.
- offer you a select list of pre-qualified contractors and help you get and evaluate bids.
- uncover all government and utility rebates and financing options. **They will even fill out your rebate and financing paperwork**!

By acting now, you can take advantage of limited **rebates of up to $1000** per household and low-rate financing options available only to EnergySmart customers. Rebate offer ends July, 31st, so sign up today!*

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OPTION	COST	DESCRIPTION
EnergySmart Full Home Assessment	$120	A technical expert will assess your home to pinpoint areas of energy waste and leakage. The Energy Advisor will use the results of that assessment to help you make a plan for your home, plus give you quick energy-saving items, help with contractor selection, and assistance with rebates and financing. The best deal of EnergySmart pathways!
Advisor-only service	$30	If you are already working closely with a contractor or know exactly what upgrades you'd like to make in your home, ask about our Advisor-only service. You will get quick energy-saving items, help with contractor selection (if needed), and assistance with rebates and financing. This option does NOT include an energy audit. For blower door / infrared testing, please select the Full Home Assessment!
Already had an audit!	FREE	If you've had an audit in the last 3 years, just provide us with the audit report and the advisor services are FREE. This includes quick energy-saving items, help with contractor selection, and assistance with rebates and financing.

Products and Services for Do-It-Yourself customers

Advantages	*Disadvantages*
• Expands the customer base and range of revenue sources	• Could drive customers towards more do-it-yourself measures, which is not in-line with the goals of market transformation for energy efficiency contractors

Guiding Questions
• Could the LEA feasibly offer these services to DIYers without detracting from its core mission? • Could the LEA act as an on-line or brick-and-mortar store for DIY energy efficiency products?

Green Savings Company is a leader in the T5 Retrofit Kit, products for commercial lighting "Retrofit Kits". Partners with utilities to chip in for rebates or discounts for these products: *<http://greensavingsco.com/2010/11/the-t5-retrofit-kit/>*

Appendix B: Contracts:

Selected excerpts from *The Future of Better Buildings Neighborhood Program's Local Energy Alliances: Guidebook for Financial Sustainability Post-ARRA Funding*. Written by Kathleen Fraser and Glenn Barnes (Environmental Finance Center):

Units of Government

Summary:

Many local and state governments have used ARRA grant dollars and other funds to establish public subsidy programs for energy improvements. As a qualified leader of energy efficiency program design and implementation, a LEA may be contracted by units of government to administer a comprehensive energy efficiency retrofit program for residential and commercial building owners with the units of government supplying the capital necessary for the public subsidies.

Governments themselves have several options for this capital. Three common government finance options:

- **Taxes:** Taxes on property (local governments), income (state government, largely), and sales (both) provide the majority of revenue for governments. Taxes support the general functions of government which could include public subsidies of energy improvements. This capital can come from current tax receipts or from unrestricted fund balance (i.e., the government's savings account).
- **Debt:** Governments have the ability to borrow money at relatively low rates due to their stable nature and access to tax-free lending. Governments could borrow money to seed an energy loan program and then use the repayments on the loans to pay back their own debt, with the LEA serving as the program administrator. Right now, governments have access to Qualified Energy Conservation bonds (QECBs),[3] which are low-interest tax credit bonds that can be used for energy projects including community-based loan programs. Debt would not be a capital option for rebate programs.
- **Grant pass-through**: There may be some federal or state grants that only units of government are eligible to receive. The government could apply for these grants, and if their application is successful, the government can pass the funds on to a third party such as a LEA to operate the energy program.

Governments also have access to a few innovative sources of capital, including but not limited to:

- **Special taxes on carbon**: Governments can impose a special, specific tax related to the impacts of carbon dioxide. These taxes are very unusual in the United States in general and especially in the southeast. The City of Boulder, CO has a Climate Action Plan tax,[4] passed by

[3] http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=US51F&re=1&ee=1
[4] http://www.bouldercolorado.gov/index.php?option=com_content&task=view&id=7698&Itemid=2844

referendum, that charges residents for the carbon impacts of their electricity use and is earmarked specifically for instituting the city's energy improvement program.

- **Greenhouse gas auction proceeds**: In areas with cap-and-trade programs for carbon, governments have access to the proceeds of the carbon auctions and can use these funds for energy programs. Currently, auctions under the Regional Greenhouse Gas Initiative (RGGI) in the northeast United States creates funds to be used for energy programs such as the Green Jobs Green New York program operated by NYSERDA.[5] There are no current or planned greenhouse gas auction programs in the southeast.
- **Sustainable energy utility enterprise fees:** In addition to its general functions that are supported by taxes, units of government also operate independent, business-like enterprises that are supported by fees (such as local water and wastewater utilities). Governments could charge a fee to all citizens to support an energy improvement program that benefits the entire community and then re-distribute those funds through a LEA into public subsidies. While this concept is new for energy programs, it is not uncommon for other government environmental services such as stormwater programs.
- **Environmental penalties:** Companies or others that are in violation of environmental laws pay penalties that can be designated as capital for energy improvement programs. For example, Tennessee is operating a program called the Clean Tennessee Energy Grant Program[6] which provides grants to public and private entities and is funded by a federal court settlement of an enforcement action under the federal Clean Air Act that resulted in a consent decree with the Tennessee Valley Authority (TVA).

Advantages	*Disadvantages*
• Governments have access to large amounts of sustainable funds through taxes, fees, and other sources • Governments may not have the expertise that LEAs do to operate programs or may run into procurement rules that make running programs difficult	• Funding for rebate and other non-revolving program designs would need to be renewed every year • Funds subject to changes in organizational priorities, politics, and the availability of funding

Guiding Questions
• Does the LEA have a good relationship with the unit of government, and does the unit of government recognize the value of the LEA's program? • Is the unit of government operating an energy program that the LEA could operate more efficiently? • Does the unit of government have an appetite to create and sustain an energy finance program using public tax and fee revenue?

[5] http://www.nyserda.ny.gov/Program-Areas/Energy-Efficiency-and-Renewable-Programs/Green-Jobs-Green-New-York.aspx

[6] http://www.tn.gov/environment/energygrants/

Electric and Natural Gas Utilities

Summary: While electric and natural gas utilities are in the business of selling energy, they have a number of reasons to support conservation efforts, including mandates from state regulations, operating efficiency during times of peak demand (reducing the need to bring inefficient plants on-line, for example), delaying the construction of future generation capacity, and good customer service. These utilities typically come in one of three forms: large investor-owned utilities, municipal utilities that are owned and operated by units of government, and cooperative utilities that are member-owned not-for-profits. Many utilities in the southeast and around the country subsidize energy improvement programs through rebates and loans. Cooperative utilities across the country, for example, likely provide most of the energy finance programs to rural America. While the utility has sustained contact with its customers through its billing cycles, LEAs may be better able to operate energy programs due to their presence in the market and network of contractors. LEAs should look for opportunities to operate programs on behalf of utilities using utility capital for the public subsidies of projects. Sources of utility capital include:

- **Revenue from utility rates**: Utilities can build money for energy programs into the rates they charge their customers or consider promoting conservation as part of their overall business plan. Some of the largest energy finance programs in North America are supported by rate-payer capital, such as the Manitoba Hydro Power Smart Residential Loan Program,[7] which has issued more than $200 million in energy loans to approximately 51,000 residences since 2001.
- **Public Benefits Funds**: Also called Systems Benefits Funds, this is a small surcharge applied to the bills of all customers based on their usage. The surcharges are aggregated and then used to fund energy efficiency and renewable energy projects. Sometimes, the utility operates the fund, while in other cases the surcharges are collected by the utility and passed on to a third party administrator, often a state agency. The only public benefits fund in the southeast is a voluntary contribution program in Virginia,[8] though they do exist as mandatory programs in other parts of the country.[9]

Advantages	*Disadvantages*
• Utilities have access to large amounts of sustainable funds through rates charged to customers or public benefits funds • Utilities may not have the expertise that LEAs do to operate programs, especially municipal or cooperative utilities • Utilities have financial incentives to	• Utility may be operating a program already • The amount of capital available may not be large, especially from municipal and cooperative utilities

[7] http://www.hydro.mb.ca/your_home/residential_loan.shtml
[8] http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=VA21R&re=1&ee=1
[9] http://www.dsireusa.org/incentives/index.cfm?SearchType=PBF&&EE=1&RE=1

encourage conservation of energy	

Guiding Questions
• Does the LEA have a good relationship with the utility, and does the utility recognize the value of the LEA's program? • Is the utility operating an energy program that the LEA could operate more efficiently? • Does the utility have an appetite to create and sustain an energy finance program using rate-payer capital?

Appendix C:

Selected excerpts from *The Future of Better Buildings Neighborhood Program's Local Energy Alliances: Guidebook for Financial Sustainability Post-ARRA Funding*. Written by Kathleen Fraser and Glenn Barnes (Environmental Finance Center):

Innovative Financing Tools:

In addition to sources of capital, LEAs can consider implementing a program design that is sustainable over time as a way to increase the life of its energy improvement program. Certain program designs only allow for funds to be spent once. These include rebates, buying down the interest rate of private loans, and making loans backed by debt. Once rebates and interest rate buy-down funds are spent, they are gone. And the repayments made on loans backed by debt must be used to pay off the debt itself.

There are, however a few program designs that allow capital to be "re-used"—that is, the initial capital can support more than one project over time: revolving loan funds and loan loss reserves.

A **revolving loan fund** makes loans to individual borrowers, ideally below market value, and, as the borrowers pay off their debt, loans the repayments to new borrowers. Money only leaves the revolving cycle if there are defaults on loans or if the program needs to take funds out to cover administrative expenses. Revolving loan funds are especially useful if the LEA does not have a sustainable source of capital, such as a governmental or foundation grant. The LEA only needs funding once to get the revolving loan program started, and interest paid on the loans can help to cover the administration and management costs of operating the loan program. If the LEA is operating the revolving loan fund program itself, it will be responsible for underwriting, collecting monthly payments, and pursuing loans in default.

One possible collection method for revolving loans is through utility bills, often called **on-bill financing**. Under this model, the LEA would partner with a utility to collect payment monthly through its bills and pass the payments to the LEA. This collection method has a number of advantages—people are used to paying utility bills already, and they would be able to see their energy savings alongside their loan repayments to underscore how energy projects can help pay for themselves over time. One concern with this type of arrangement is what priority the loan repayment will be given on the utility bill. In other words, if a utility customer only pays his or her bill in part, will the LEA receive a proportional share of the loan repayment, or will they only receive funds after the utility has collected its entire share? In some instances, utilities will keep the loan attached to the meter, which means that if a customer moves away, the new property owner will pick up repayment of the loan.

Governments operate a similar repayment mechanism called **Property Assessed Clean Energy**, or PACE. PACE is not a loan but rather an assessment made on real property to pay back the costs of a public improvement, in this instance an energy improvement. Governments would pay for the improvement and then assess the property owner, putting a lien on the property and collecting payment through property tax bills. The lien remains with the property even if the owner moves and is paid back by the new property owner. LEAs do not have the authority to assess property but could partner with governments in operating the programs if the government has the authority to do so under state law.[10] Early PACE programs focused on improvements to residential property; however, a 2010 memorandum from Fannie Mae and Freddie Mac that expressed concerns with PACE liens being primary on properties put most PACE programs on hold. There are some commercial PACE programs operating around the country and a handful of residential programs that are operating within the Fannie Mae framework.

The other major category of programs where initial capital can support more than one project over time is **loan loss reserve funds**. Loan loss reserve funds use capital from LEAs and others to secure private lending. In this program design, private banks and credit unions initiate and underwrite loans, collect monthly payments, and pursue loans in default. The loan loss reserve fund is a pool of money that is available to the lender in the case of a default—it covers some percentage of their loss (usually 75 to 90 percent of the outstanding balance of the loan). This program design has several attractive features. First, lending experts and not LEAs would make the loans. Second, money only leaves the program in the case of defaults. Third, banks are willing to loan out more money than is deposited in the loan loss reserve (sometimes 10 or 20 times what is in the reserve account), thus making scarce capital go further. And, fourth, banks are willing to offer loans with lower interest rates and/or longer tenors than their market loans because of the loan loss reserve pool. Banks are generally hesitant to extend credit to riskier borrowers even with the presence of the loan loss reserve pool because the lenders are responsible for some portion of the default, so this option is less attractive for programs that wish to reach under-served populations.

Early data from energy finance programs suggest that the default rates of energy loans may be less than the typical default rate for consumer loans, so both the revolving loan fund design and the loan loss reserve design have promise for LEAs that can secure a single capital investment and then maintain programs over time.

[10] http://dsireusa.org/solar/solarpolicyguide/?id=26

Works Cited

[i] *Recovery*. Accessed online April 1, 2012. <www.recovery.gov>

[ii] Lovins, Amory. "Negawatt Revolution" *Across the Board.* 1990. PDF File. Accessed online April 1, 2012. <http://www.rmi.org/Knowledge-Center/Library/E90-20_NegawattRevolution>
[iii] Stark, Anne. "Americans using more fossil fuels" News Release, LBNL. Nov 2, 2011. Accessed online April 1, 2012. <https://www.llnl.gov/news/newsreleases/2011/Nov/NR-11-11-02.html>
[iv] Ibid.
[v] Grande, Hannah, et al. "Unlocking Energy Efficiency in the U.S. Economy" *McKinsey & Company*. July 2009. Executive Summary. 1-2. PDF File. Accessed online April 1, 2012.
[vi] Creyts, Jon, et al. "Reducing U.S. greenhouse gas emissions: How much at what cost?" McKinsey & Company. December 2007. Accessed online April 1, 2012.
[vii] Ibid.[vi]
[viii] "Levelized Cost of Energy Analysis, version 4.0" *Lazard.* June 2010. PDF File presentation. Accessed online April 1, 2012.
[ix] Ibid.[vii]
[x] Federal Energy Regulatory Commission, Midwest Energy Infrastructure Conference, Nov 2002. Accessed online April 1, 2012 via SEEA website <seealliance.org>
[xi] Southeast Energy Efficiency Alliance. Accessed online April 1, 2012. < seealliance.org>
[xii] "Southeast Energy Consortium". Better Buildings Neighborhood Program. Accessed online April 1, 2012 <http://www1.eere.energy.gov/buildings/betterbuildings/neighborhoods/seea_profile.html>
[xiii] Federal Energy Regulatory Commission, Midwest Energy Infrastructure Conference, Nov 2002. Accessed online April 1, 2012 via SEEA website <seealliance.org>
[xiv] "Recovery Act Success" *Department of Energy*. Jan 2012. PDF File. Accessed online April 1, 2012 <http://energy.gov/downloads/successes-recovery-act-january-2012>
[xv] "Recovery Act" *Department of Energy*. April 1, 2012. <http://energy.gov/recovery-act
[xvi] "Background: ARRA and Recovery Through Retrofit" *Department of Energy*. Accessed online April 1, 2012. <http://www1.eere.energy.gov/buildings/betterbuildings/neighborhoods/history.html>
[xvii] "Recovery through Retrofit" White House Council on Economic Quality. October 2009. PDF File. Accessed online April 1, 2012.
[xviii] Ibid.[IX]
[xix] "Our Partners" Better Buildings Neighborhood Program. *Department of Energy*. Accessed online April 1, 2012.
[xx] "What is the Better Buildings Program" Better Buildings Neighborhood Program. *Department of Energy*. Accessed online April 1, 2012. Diagram created by Fraser, K. <http://www1.eere.energy.gov/buildings/betterbuildings/neighborhoods/about.html>
[xxi] "About SEEA- Mission and Goals" Southeast Energy Efficiency Alliance. Accessed online April 1, 2012. <http://www.seealliance.org/about/mission.php>
[xxii] Ibid.[xxi]
[xxiii] "Programs- Better Buildings" Southeast Energy Efficiency Alliance. Accessed online April 1, 2012. <http://www.seealliance.org/programs/better.php>
[xxiv] "Neighbors can join forces to increase incentives" Department of Energy. Accessed online April 1, 2012. <http://www1.eere.energy.gov/buildings/betterbuildings/neighborhoods/seea_profile.html#neighbors>
[xxv] Ibid.[xxiii]

[xxvi] Local Energy Alliance Program. Accessed online April 1, 2012. <http://www.leap-va.org/>
[xxvii] Fraser, Kathleen, and Glenn Barnes. *The Future of Better Buildings Neighborhood Program's Local Energy Alliances: Guidebook for Financial Sustainability Post-ARRA Funding*. 2012. Print.
[xxviii] Fuller, M. (2011, August 3). Lawrence Berkeley National Lab. (K. Fraser, Interviewer)
[xxix] RePower Bainbridge. Accessed online August 1, 2011. <http://www.positiveenergybi.org/repowerbainbridge>
[xxx] Energy Smart. Accessed online April 1, 2012. <http://www.energysmartyes.com/home>
[xxxi] Ibid.[xii]
[xxxii] Ibid.[xii]

References

The following reports, white papers and interviews set a baseline understanding and the foundation for this research and analysis:

Adams, C. (2011, August 21). LEAP. (K. Fraser, Interviewer)

Barger, N. (2011, June 22). Energy Efficiency Services Coordinator, CESI. (K. Fraser, Interviewer)

Barnes, G. (2011, June-September). UNC-Chapel Hill Environmental Finance Center. (K. Fraser, Interviewer)

Brown, Marilyn and Gumerman, Etan. *Energy Efficiency in the South.* April 2010. Southeast Energy Efficiency Alliance. Online PDF Retrieved April 1, 2012. <seealliance.org>

Byrnett, D. (2011, July 5). via email. (K. Fraser, Interviewer)

Clymer, J. (2011, July 11). *DOE conference call presentation slides, Utility Partnerships, ICF International.* Retrieved July 14, 2011, from Department of Energy : http://www1.eere.energy.gov/wip/solutioncenter/webcasts/default.html

Cordell, B. (2011, July 8). Executive Director, Sustainability Institute. (K. Fraser, Interviewer)

Dayton, D. (2011, July 6). CEO, CESI. (K. Fraser, Interviewer)

Fuller, Merrian, et al. *Driving Demand for Home Energy Improvements.* Lawrence Berkeley National Lab. Sept 2010. Online PDF Retrieved April 1, 2012 <http://drivingdemand.lbl.gov/>

Holthoff, L. (2011, August 18). NEXT STEP. (K. Fraser, Interviewer)

Lawrence Berkeley National Lab. (2011, June 20). *Using Qualified Energy Conservation Bonds (QECBs) to Fund a Residential Energy Efficiency Loan Program: Case Study on St Louis County, MO.* Retrieved July 18, 2011, from Environmental Energy Technologies Division: http://eetd.lbl.gov/ea/emp/reports/ee-policybrief_062011.pdf

Livingston, D. (2011, June 23). *New York Passes Historic Green Jobs Financing Law.* Retrieved July 8, 2011, from Long Island Press: http://www.longislandpress.com/2011/06/23/new-york-passes-historic-green-jobs-financing-law/

"Our Insights: Organizational Structure; Sustainable Revenue Streams; Financial Incentives; Marketing; Pay for Performance; Energy Performance Contracting; Non-Profit Organizations; Utility Interaction; Workforce Development; IT Solutions" A White Paper Series. *Clean Energy Solutions, Inc*. Accessed online April 1, 2012. <http://ces1.squarespace.com/sustainable-reve/?SSScrollPosition=0>

Paddock, R. C. (2007, June 13). *Universities sign `climate neutral' pact.* Retrieved July 11, 2011, from Los Angeles Times <http://articles.latimes.com/2007/jun/13/local/me-green13>

State Energy Efficiency Policy Database. American Council for an Energy-Efficient Economy. 2010. Accessed online April 1, 2012. <http://www.aceee.org/sector/state-policy>

Qualified Energy Conservation Bonds-QECBs-Updates from the Field Slides.pptx, DOE webinar slides. July 12, 2011.