Albany County, NY Energy Efficiency Financing Options

Prepared for

Albany County, New York, through assistance under the Climate Smart Communities Regional Coordinator Pilot Program

Prepared by

Meister Consultants Group, Sub-consultant to VHB, Inc.,
on behalf of the Capital District Regional Planning Commission.

July 29, 2013

NOTICE

This report was prepared by Meister Consultants Group, a sub-consultant to VHB Engineering, Surveying and Landscape Architecture, P.C., in the course of performing work contracted for the Capital District Regional Planning Commision, and sponsored by the New York State Energy Research and Development Authority (hereafter "NYSERDA"). The opinions expressed in this report do not necessarily reflect those of NYSERDA or the State of New York, and reference to any specific product, service, process, or method does not constitute an implied or expressed recommendation or endorsement of it. Further, NYSERDA, the State of New York, and the contractor make no warranties or representations, expressed or implied, as to the fitness for particular purpose or merchantability of any product, apparatus, or service, or the usefulness, completeness, or accuracy of any processes, methods, or other information contained, described, disclosed, or referred to in this report. NYSERDA, the State of New York, and the contractor make no representation that the use of any product, apparatus, process, method, or other information will not infringe privately owned rights and will assume no liability for any loss, injury, or damage resulting from, or occurring in connection with, the use of information contained, described, disclosed, or referred to in this report.

Table of Contents

1. Introduction

There is a broad range of energy efficiency financing and ownership models that have been developed in the United States (US) since the 1980s. Some of these, such as shared savings, have fallen out of favor, while others are only recently emerging in the market. The diversity of available energy efficiency business models has made it challenging for building owners, like Albany County, to assess the basic options that are available to them.

Despite this confusion, there is a broad consensus that energy efficiency services can generate significant financial gains. In 2011, Orangetown, New York signed a 10-year energy performance contract with Siemens Building Technologies to conduct a wide range of building upgrades, with guaranteed savings of $220,000 per year. In the first year, the town realized $167,000 in direct energy savings (from reduced electricity and gas use), and a further $62,000 in operational savings, for a total of $229,000. Research on performance contracting in the U.S. and elsewhere over the last three decades has revealed that there are similar experiences from government-owned as well as commercial and industrial buildings, in a wide range of different climates and geographical contexts. Awareness has grown that energy efficiency investments can be among the highest-yielding investments in the energy sector and that beyond financial gains, they also create a number of other positive benefits, including improved building performance, enhanced occupant comfort, and increased worker productivity.

On average, the lowest hanging fruit in terms of energy efficiency, such as boiler upgrades or lighting retrofits, can have simple pay-back periods of two years or less, offering rates of return in the 30-40% range. “Higher-hanging fruit,” such as building envelope upgrades, may have longer paybacks of 12 years or more, but can still generate significant value for the money invested under the right financing conditions. As a result, municipal governments across the U.S. are increasingly looking at energy efficiency investments, as is the federal government through its Federal Energy Management Program (FEMP).[1]

Albany County has previously pursued energy efficiency upgrades through the New York Power Authority (NYPA) Energy Efficiency Program, with support from federal American Recovery and Reinvestment Act grant funds. Albany County has also secured low-interest NYPA financing for additional projects and is contemplating whether to continue to work through NYPA programs for additional energy efficiency upgrades or whether to pursue a performance contract, or other innovative energy financing and ownership structures.

The goal of this memo is ultimately to define some of the pros and cons of different energy efficiency financing options, with a focus on different models of performance contracting. It attempts to present Albany County staff, in non-technical language, with a set of choices and a brief overview of the various trade-offs involved. What are the pros and cons of different performance contracting options? Is it better to use public sources of finance, or to rely on private capital? What are the major risks that Albany County should be aware of?

Many reports on financing energy efficiency tend to conflate different performance contracting models with the particular financing approaches used. Different ownership and financing approaches can be utilized to finance energy efficiency, however, and this report

[1] http://www1.eere.energy.gov/femp/

explicitly keeps these two discussions separate. Note that there are also a range of innovative financing instruments that have been developed that this report does not cover in detail; a few of these, such as on-bill financing and commercial Property Accessed Clean Energy (PACE), are summarized in the Appendix.

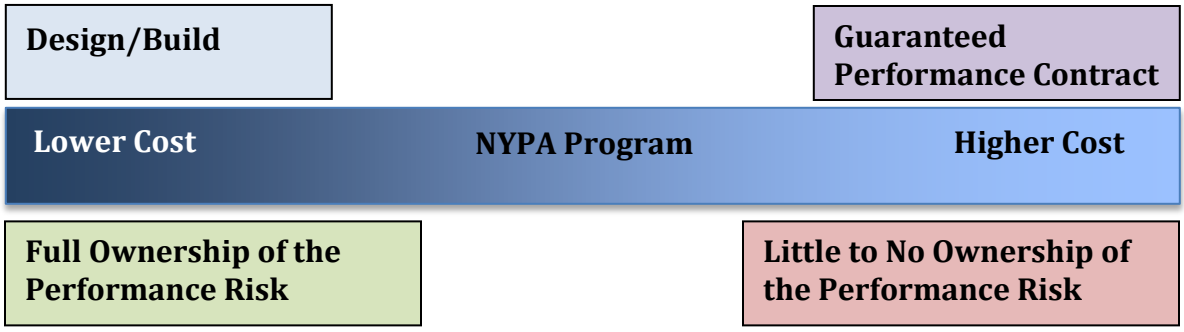
This memo is organized as follows:

- Section 2 examines the spectrum of risk and ownership, and looks at three broad categories of financing energy efficiency: design/build, traditional ESCO models, and emerging models such as energy service agreements (ESAs) and managed energy service agreements (MESAs).
- Section 3 explores questions related to the source of capital used to finance the energy efficiency project.
- Section 4 provides a number of final considerations for Albany County staff, as well as recommendations.

2. Performance Contracting: Overview of Models and Options

One of the primary decisions that local governments face when financing energy efficiency is the amount of risk for the performance of the energy efficiency measures they are willing to assume. Figure 1 provides a simplified view of the tradeoffs between different energy efficiency procurement models, situating them along a spectrum of risk. On the left side, energy efficiency measures that Albany County simply purchases and installs outright (i.e. design/build) would likely have the lowest cost over time. However, Albany County would also be fully responsible for ensuring that the systems operate as predicted and generate the projected savings. On the right hand of the spectrum are guaranteed performance contracts, under which an energy service company (ESCO) would guarantee that the efficiency measures would deliver a certain amount of savings over time. While guaranteed performance contracts transfer the operations risk of the project to the ESCO, they also cost more over time than design/build measures since the contractors will include a mark-up on each measure installed. This section discusses these two models in greater detail, as well as models which fall more in the middle of the spectrum of risk and cost.

Figure 1: Spectrum of Risk and Ownership



As the Figure above shows, the New York Power Authority (NYPA) program is situated somewhere in the middle of this spectrum. NYPA provides design and engineering services in order to project the performance of the energy efficiency upgrades. NYPA's engineering services reduce the performance risk of energy efficiency upgrades compared to design/build measures. However, NYPA does not guarantee the performance of the measures. NYPA charges a management fee of approximately 12-15% for its energy efficiency services, which is cheaper than the approximately 25-30% mark-up charged under a guaranteed performance contract. NYPA also offers access to low interest loans. For instance, NYPA currently offers debt in New York State to eligible public entities at a floating rate of ~0.8%. It would be difficult for any competitor relying on a commercial debt or private equity to compete with this cost of capital. Also, under the current rules, public entities are not required to use NYPA's energy efficiency program in order to access NYPA's low cost of capital.

2.1 'Design/build' Model

While performance contracting may be attractive under certain conditions, it is possible for a municipal or county government to implement the energy efficiency upgrades directly by purchasing the energy efficiency and conservation measures outright. Albany County would likely bid out the design, construction and installation services to a contractor and then own the underlying assets and the risks associated with them.

Procuring and installing the upgrades directly can provide the building owner with the greatest opportunity to tap into energy savings (and returns). However, there is a range of issues that can prevent public entities from directly undertaking energy efficiency upgrades:

1. Many local and county governments may lack the knowledge, time, and/or expertise to oversee the installation of energy efficiency measures.

2. By undertaking the investments directly, county governments assume most or all of the performance risk (aside from, e.g., the warranty on the technologies installed) and therefore implicitly assume greater responsibility over the monitoring and evaluation of the project over time.

3. There may be other constraints that push energy efficiency down the list of priorities, as it comes into competition with other capital budget spending priorities, particularly if paying for the measures would involve decreasing budgets for other priority expenditures or increasing taxes or other fees.

These factors can influence the relative attractiveness of various ownership configurations, due to the different allocation of risks and responsibilities that each entails. As a result, municipal governments have sought alternative models for sharing the risks, rewards, and up-front costs of energy efficiency upgrades.

The next section looks more closely at these alternative models. It is divided into two parts: the first deals with basic performance contracting options, drawing on examples from traditional ESCOs. The second part focuses on 'emerging models' of performance contracting, such as energy service agreements (ESAs), and managed energy service agreements (MESAs). These represent a further evolution of the ESCO model, and have largely been used to adapt to evolving accounting regulations in the private sector. Each performance contracting model will be described with reference to particular case studies, and will provide Albany County with the pros and cons of each.

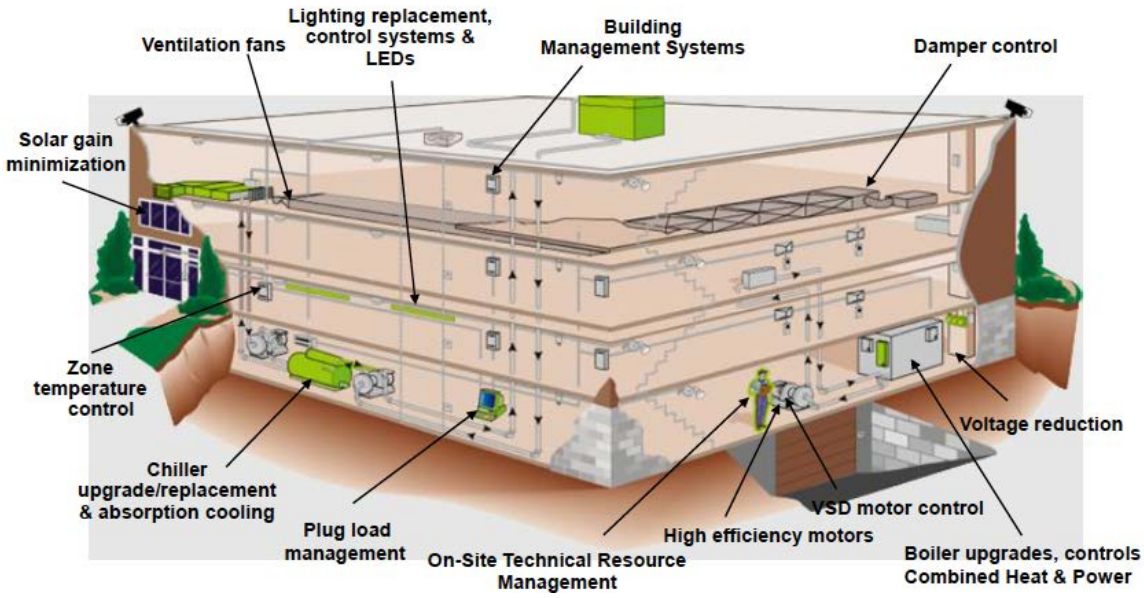
2.2 ESCO Models

ESCOs can provide a range of energy efficiency services to municipal or county governments: conducting in-depth energy audits, designing and planning the upgrades, financing, construction and installation, as well as the evaluation and monitoring of energy use over time. As such, ESCOs can help public entities overcome the lack of time and expertise that local governments may face in identifying the right building upgrades, and implementing them. ESCOs can therefore be thought of as one way of approaching energy efficiency procurement (Figure 2).

Figure 2: Overview of the Stages of Energy Efficiency Procurement

A public entity can contract out any of a number of these different steps of the process, based on their particular needs. Figure 3 provides an overview of some of the measures that an ESCO could implement to improve a building's energy performance.

Figure 3: Snapshot of Potential Energy Efficiency Upgrades



Source: EU-ESCO, http://www.eu-esco.org/fileadmin/euesco_daten/pdfs/TowardsNET-ZERO-euESCO.pdf

The following provides an overview of two different categories of performance contracting structures:

1. Traditional Performance Contracting
2. Emerging Models of Performance Contracting

2.3 Traditional Performance Contracting

There is a broad range of traditional performance contracting options. One basic distinction between different ESCOs is whether the ESCO is affiliated with an original equipment manufacturer (OEM), or whether it operates on a technology neutral basis (Table 2).

Table 2: Overview of Traditional ESCO Models

1	**Technology Specific ESCO models (OEM affiliated)** e.g. Johnson Controls, Honeywell	In this model, a technology provider or manufacturer's ESCO division designs and supplies engineering solutions using their own proprietary technologies and innovations (energy management systems, etc.)
2	**Technology Neutral ESCO models** **e.g. Clark Energy**	In this model, an ESCO unaffiliated with specific equipment designs and develops custom solutions in collaboration with the building owner or occupant, aiming to select best-in-class technologies for each upgrade being considered (boilers, chillers, insulation, etc.)

Public entities seeking to procure energy efficiency services should be cognizant of the fact that these ESCOs may have an incentive to use performance contracts as a vehicle for selling their OEM products and may emphasize certain solutions as a result. At the same time, some jurisdictions may feel more comfortable working with an OEM-affiliated ESCO because of familiarity with the brand name and the ability to get service over the full length of the contract.

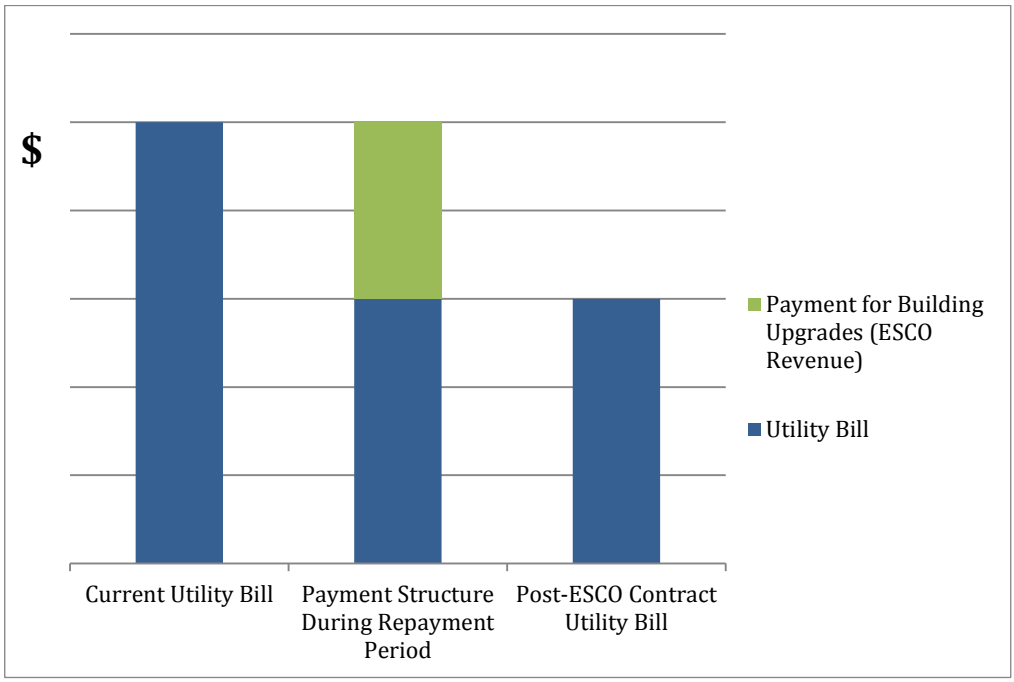
Under traditional performance contracting, an ESCO provides a client (such as Albany County) with a guarantee[2] that an agreed-upon set of energy-saving measures will perform as stipulated in the performance contract. The ESCO typically guarantees a certain level of energy savings (or locks in historical energy costs) over a fixed period of time, based on a standard set of assumptions about building occupancy and usage. If the performance contractor does not deliver the promised savings, they are responsible to pay the difference. ESCOs earn their profits on the basis of the energy savings that the investments generate over time, as well as the markup they charge on component costs.

What generates value in this equation is the difference between pre-installation and post-installation energy costs. The key question is how this added value gets apportioned between the building owner (e.g. Albany County), and the performance contractor; another essential consideration relates to the question of who assumes which risks (performance risk, energy price risk, etc.)

Figure 4 provides a snapshot of the basic financial structure behind a typical ESCO-based energy efficiency investment.

[2] Guaranteed performance contracts have emerged as the industry standards. ESCOs have also offered shared savings in the past under which a certain level of performance was stipulated (but not guaranteed) and the host paid the ESCO based on the projected savings. This model will not be explored in detail since it has declined in popularity as a result of the potential for misaligned incentives between the ESCO and host site or building owner.

Figure 4: Depiction of Pre- and Post-Installation Energy Costs[3]



Source: MCG 2013

While simplified, Figure 4 provides an overview of the basic relationship depicting historical energy bills, fixed bills during the repayment period, followed by a period of reduced energy and operating costs afterwards. During the repayment period, the operating budget is likely to remain largely unchanged. This depiction assumes that historical energy costs are locked in for the repayment period.

There are several advantages of implementing energy efficiency upgrades via ESCOs:

1. After the upgrades are completed, the building owner benefits from reduced energy and operation costs, and has often increased the value of their building in the process.

2. ESCOs have historically enabled energy efficiency investments to be treated off-balance sheet. Keeping such investments off-balance sheet can have important accounting benefits and can potentially affect both the municipal government's cost of borrowing as well as its capacity to take on additional debt. While this accounting treatment is changing - as described in the following section - the ability to finance energy efficiency off-balance sheet has been one of the key factors shaping the ESCO industry in many parts of the U.S.

3. ESCOs provide an important role as a way of mitigating risks (financial, performance, and energy price, among others) for public entities. Provided that:

[3] While NYPA does not have funds dedicated for energy efficiency rebates and grants, it can award funds that become available through other programs. For instance, the Times Union Center in Albany County recently received energy efficiency grants under the American Recovery and Reinvestment Act (ARRA).

1) the performance contract is carefully designed, 2) that the historical baseline is well-defined, and 3) that changes to building occupancy or usage are properly monitored and accounted for over time, performance contracts can shelter public sector clients from most if not all of the risks of investing in energy efficiency upgrades.

4. By organizing performance contracts over a longer horizon (12-20 years) it has become possible for customers to tap into deeper energy savings – often by blending short payback measures like lighting with longer-term measures such as chiller upgrades or roof replacements – than would be possible under shorter term arrangements, or under a 'design/build' approach.

However, for public entities like Albany County, there are a few potential disadvantages of ESCOs that are worth bearing in mind:

1. In exchange for assuming operational risk, ESCOs put a significant mark-up on products installed, and charge project management costs and other fees. This can put upward pressure on overall project costs, and reduce the share of total energy savings that accrue to the county government.

2. It can be difficult to design, implement, and monitor the performance of an ESCO contract over time. Key project staff can change, or retire, and this can make it difficult to ensure continuity. Well established ESCOs, such as OEM providers, may mitigate this risk to some degree, but it remains an important consideration particularly for longer-term ESCO contracts (e.g. 12 years or more).

3. The devil is in the details: it can be difficult to design a successful performance contract that appropriately identifies and allocates all major risks.

4. As highlighted briefly above, it can also be difficult to stipulate an appropriate historical baseline, and to deal with other changes in occupancy or the technologies used on-site that arise over the course of the contract.

Each of these issues will be revisited in the conclusion, including suggestions for how some of them can be mitigated, or overcome.

Please see below for examples of the two approaches to traditional ESCO models.

CASE STUDY #1: Technology Specific ESCO Orangetown, NY	
Total Project Cost: **USD $2.5 Million** **Source:** http://www.dec.ny.gov/docs/administration_pdf/epcguide.pdf	In 2011, the Town of Orangetown signed a 10-year energy performance contract with Siemens Building Technologies to conduct a wide range of energy and water related upgrades. These upgrades included switching to LED and compact fluorescent lights, installing automatic control thermostats, and replacing old boilers in over 10 municipal buildings. Under the agreement, savings of $220,000 per year are guaranteed to Orangetown. Over the course of the performance contract, facilities staff will work closely with Siemens to monitor and verify energy performance on a day-to-day basis. In addition, Siemens is required to prepare an annual verification report with data and analytics on electricity and gas usage. In the first year, the town realized $167,000 in direct energy savings (from reduced electricity and gas use), and a further $62,000 in operational savings, for a total of $229,000.

CASE STUDY #2: Technology Neutral ESCO The State of Missouri, Johnson Controls and TEAM CO-OP	
Total Project Cost: **USD $24 Million** **Source:** **http://www.johnsoncontrols.de/content/dam/WWW/jci/be/case_studies/SOM_case_study_-_CABA_report.pdf**	In 2007, the State of Missouri contracted Johnson Controls, in conjunction with TEAM CO-OP (a consortium of technology and IT companies) to undertake a wide range of upgrades across several hundred government-owned and operated facilities. After conducting a facilities assessment of its real estate portfolio, the consortium undertook a series of technological, process, and automation upgrades to the building portfolio and combined this with an integrated monitoring system to track performance over time. This enabled the State of Missouri to better manage its buildings, and provided executives, managers, and building occupants with real-time information about building and energy performance. Under this performance contracting arrangement, the State of Missouri leased the equipment from Johnson Controls (who assumed all of the performance risk), and the lease payments were themselves assured through the performance guarantees.

2.4 Emerging Models of Performance Contracting

As discussed in the Case Study of Brooklyn College, ESCOs have used operating leases when structuring their performance contracts. One of the motivating factors for using operating leases is to keep the financing "off-balance sheet." This means that the money borrowed to pay for the energy efficiency does not affect the borrower's (e.g. Albany County) ability to secure additional debt. In light of recent changes to national accounting standards, operating leases are no longer considered off-balance sheet under Financial Accounting Standards

Board (FASB) rules. It is unclear at this stage whether Government Accounting Standards Board (GASB) rules will follow this trend – but this is a trend that public sector entities should be aware of.

As a result of these ongoing changes, new models of performance contracting such as Energy Service Agreements (ESAs) and Managed Energy Service Agreements (MESAs) have been developed, partly in an attempt to enable clients to continue to treat debt secured for energy efficiency upgrades as off-balance sheet.

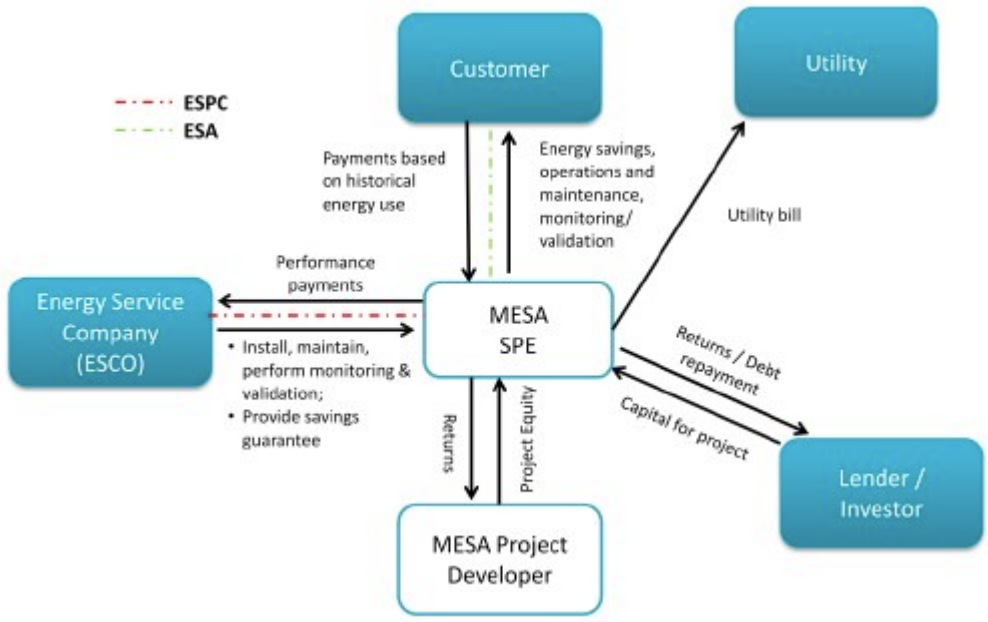
In practice, ESAs and MESAs involve inserting a new entity into the process that manages the relationship between the ESCO (engineering services provider), the customer, the utility, and the investor(s). In the process, the ESA or MESA firm typically organizes the financing (both debt and equity), and signs a contractual agreement with the ESCO for both installation and operations and maintenance (O&M) of an agreed-upon set of building upgrades. The ESCO ultimately installs the upgrades and provides on-going support, maintenance, and monitoring for the customer.

Table 3: Overview of ESA and MESA Models

1	**Energy Service Agreements (ESAs) (e.g. Metrus Energy)**	In this model, a Special Purpose Entity (SPE) operates between the performance contractor and the building owner. Under an ESA, the contract is structured as a service payment and is based on the cost of the avoided energy use (e.g. $/kWh); as such, it can be treated as an operating expense. The ESA company generally secures all aspects of the financing, and the contract can be designed to provide customers with immediate energy savings in relation to their historical energy costs.
2	**Managed Energy Service Agreements (MESAs): (e.g. SciEnergy)**	Under a MESA structure, an SPE enters a contractual relationship between a traditional ESCO and a customer seeking energy efficiency upgrades. In contrast to an ESA model, building owners or occupants agree to lock-in fixed utility payments ($ per kWh or therm) over a set period of time, and **formally transfer responsibility for paying their utility bill(s)** to the SPE. Customers benefit from long-term energy price stability as well as achieving improvements to their buildings. Financing is typically organized by the MESA SPE in a turn-key operation.

Figure 5 provides a more detailed overview of how this works in practice.

Figure 5: Depiction of a Managed Energy Service Agreement

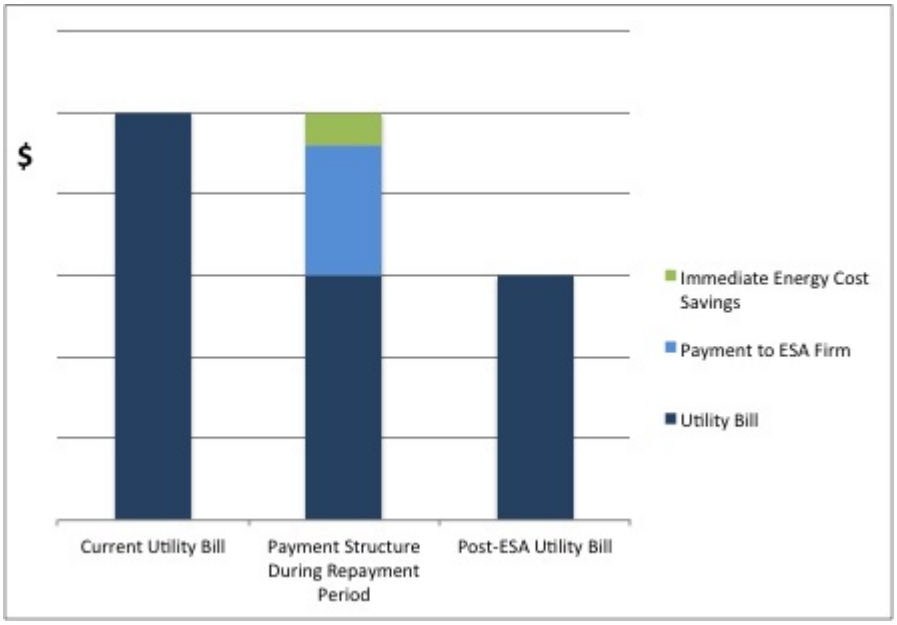


Source: Energy Real Play (http://www.energyrealplay.com/?page_id=99)
ESPC: Energy Service Performance Contract
SPE: Special Purpose Entity

As can be seen in Figure 5, a project developer establishes an ESA or MESA firm in the form of a special purpose entity (SPE) that is responsible for coordinating between the traditional ESCO, lenders, and the customer. In the case of MESAs, the special purpose entity also interacts directly with the utility, since it also assumes responsibility over the utility bill. The project developer is generally comprised of the investor, or group of investors, who are engaged in financing energy efficiency services. As such, they provide equity to the SPEs and oversee their management. Each project under an ESA or MESA structure will generally be conducted and overseen by an individual SPE.

Both ESAs and MESAs can be designed to provide immediate energy cost savings to the customer, as shown in Figure 5.

Figure 5: Pre and Post-Installation Energy Costs, with Service Payment to ESA



Source: MCG 2013

There are a number of advantages of adopting an ESA or MESA-based model:

1. Both are structured to be insulated against changes in future accounting rules, and could continue to be treated as off-balance sheet (depending on interpretation by accounting professionals).

2. They typically come in the form of a one-stop-shop, providing an integrated package that can significantly reduce the complexity and time demands of the transaction for the client. This can make them an attractive option for customers who may not have the time and/or resources to devote to designing and implementing upgrades themselves, or designing and structuring a performance contract with a traditional ESCO, and would prefer the simplicity of a turn-key operation.

3. In some cases, they can be designed to provide immediate savings over historical utility bills. This can be an important factor in fostering support for the efficiency upgrades, or for a particular performance contracting option, or provider.

However, there are also disadvantages to ESA or MESA-based models:

1. Since ESAs and MESAs are predominantly financed with commercial debt or with equity, they typically come at a mark-up. This may make them attractive for certain commercial and private sector clients, but for local governments that have access to low cost loans or tax-exempt municipal bonds, ESAs and MESAs may seem more expensive by comparison.

2. ESAs and MESAs introduce another intermediary in the process, which arguably introduces additional costs, and subtracts from the future cost savings for the public.

3. By introducing additional contractual layers (e.g. between ESCOs and ESA/MESA firms, or between the MESA parent company and the Special Purpose Entity), this can increase the risks of contractual and other difficulties, particularly over a 10-20 year timeframe.

CASE STUDY #3: Energy Services Agreement (ESA) **BAE's MERRIMACK FACILITY, METRUS**	
Total Project Cost: **USD $1.1 Million**	BAE wanted to reduce energy use with a range of equipment upgrades and building retrofits at its 467,000 sq. ft. Merrimack facility in New Hampshire. It sought a financing solution that could eliminate the upfront costs and be replicated across its other facilities.
Source: **http://metrusenergy.com/wp-content/uploads/2013/02/Metrus_BAE-Case-Study_100912.pdf**	Metrus established an Efficiency Services Agreement (ESA) with BAE and subcontracted the work to Siemens, which acted as the ESCO that implemented the upgrades. The upgrades focused on lighting retrofits, improving building automation, replacing the air compressor and transformer, as well as improving the demand control ventilation system. It is estimated that the upgrades produced annual utility savings of USD $200,000. The ESA payments that Metrus receives are based solely on the actual performance and realized savings of the project.

CASE STUDY #4: Managed Energy Services Agreement (MESA) **DREXEL UNIVERSITY, SCIenergy**	
Total Project Cost: **USD $6 Million**	SCIenergy conducted audits of campus buildings and identified five for a range of energy system improvements. The team then performed energy usage simulations of those buildings to develop a clear picture of the potential upgrades and energy savings available.
Source: **http://www.scienergy.com/success-stories**	In collaboration with the university, they selected a range of upgrades, including the installation of fume hood controls, demand controlled ventilation, the replacement of chillers, as well as the replacement of variable air volume units, cooling towers and lighting controls. The project was financed with a combination of funding sources, drawing from the Campus Energy Efficiency Fund (CEEF) as a SCIenergy investment partner that agreed to fund $4 Million of the $6 Million investment. The Reinvestment Fund of Philadelphia participated as a debt provider to SCIenergy's investment vehicle. The retrofits are expected to produce energy savings of 22% of the overall load and 35% of the HVAC load at one of the facilities, and 46% overall savings for the lab spaces.

2.5 Key Considerations for Albany County

Albany County already has experience with the NYPA energy efficiency program, which strikes a balance between the risk of direct procurement and the cost of guaranteed performance contracts. Albany County may wish, however, to move forward with a performance contract in order to secure a more thorough risk guarantee over time and to have greater flexibility with regard to the measures it includes in the contract.

If Albany County moves forward with an ESCO, here are several considerations to bear in mind:

- **Get a knowledgeable owner's agent** to represent your interests. An owner's agent acts as a mediator between the ESCO and the building owner and can fulfill a wide range of functions: they can help ensure that monitoring is being properly conducted, that the owner's interests are being well represented, and that other performance or contract design issues are addressed in a timely and efficient manner;
- **Get engaged in establishing the historical baseline of energy demand.** This includes establishing a clear framework and protocol for any adjustments to this baseline over time.
- **Clearly define the desired and anticipated operating conditions** regarding temperature, air flow, occupancy, etc.
- **Try to design performance contracts to capture both low hanging fruit** (e.g. lighting and boiler upgrades) **as well as deeper retrofits** (e.g. chillers and envelope improvements);
- **Get to know your contractor**: a good working relationship between the ESCO contractor, the project engineers, the owner's agent, and the host and occupants is essential;
- **Check the ESCO's track record:** make sure to verify previous project references and overall financial standing to make sure that the performance contractor has the financial and technical wherewithal to complete the work;
- If you're relying on a performance guarantee, **examine the legal language around the guarantee closely**. These guarantees can be difficult to enforce.
- Make sure you have **a robust monitoring and evaluation process** to quantify the energy savings: annual validation of customer savings, and of overall project performance, is essential to successful performance contracting. This can be achieved by engaging facilities staff directly in the M&V protocols.
- **Clearly distinguish between energy and operational savings.** Assumptions about operational cost savings do not always materialize exactly as anticipated. Operational savings (for instance, less maintenance on replacing used light bulbs) may only materialize if a position is eliminated. However, reducing time required for operations may free up time for operations staff to focus more on preventative maintenance (rather than reactive maintenance), which can also be a significant source of additional cost savings. **Think carefully about how long the performance contract should last**. The longer the contract period, the deeper the potential retrofit can be, and typically the lower the financing costs. However, longer contract durations can also make monitoring and evaluation more difficult and can introduce further uncertainties due to shifting occupancy levels, or the parallel need for other building upgrades or technology changes

that alter energy use patterns. There can be an "inflection" point for contract length under which it becomes economically disadvantageous to have a contract beyond a certain number of years (e.g. 14) even if an agency is permitted to do so.

- **Think carefully about the contract design. While resolving these contract design issues at the outset can be difficult and time-consuming**, it can help avoid challenges down the road.
- **Conservatism in the overall energy performance assumptions is generally advised**, regardless of the contracting option chosen.

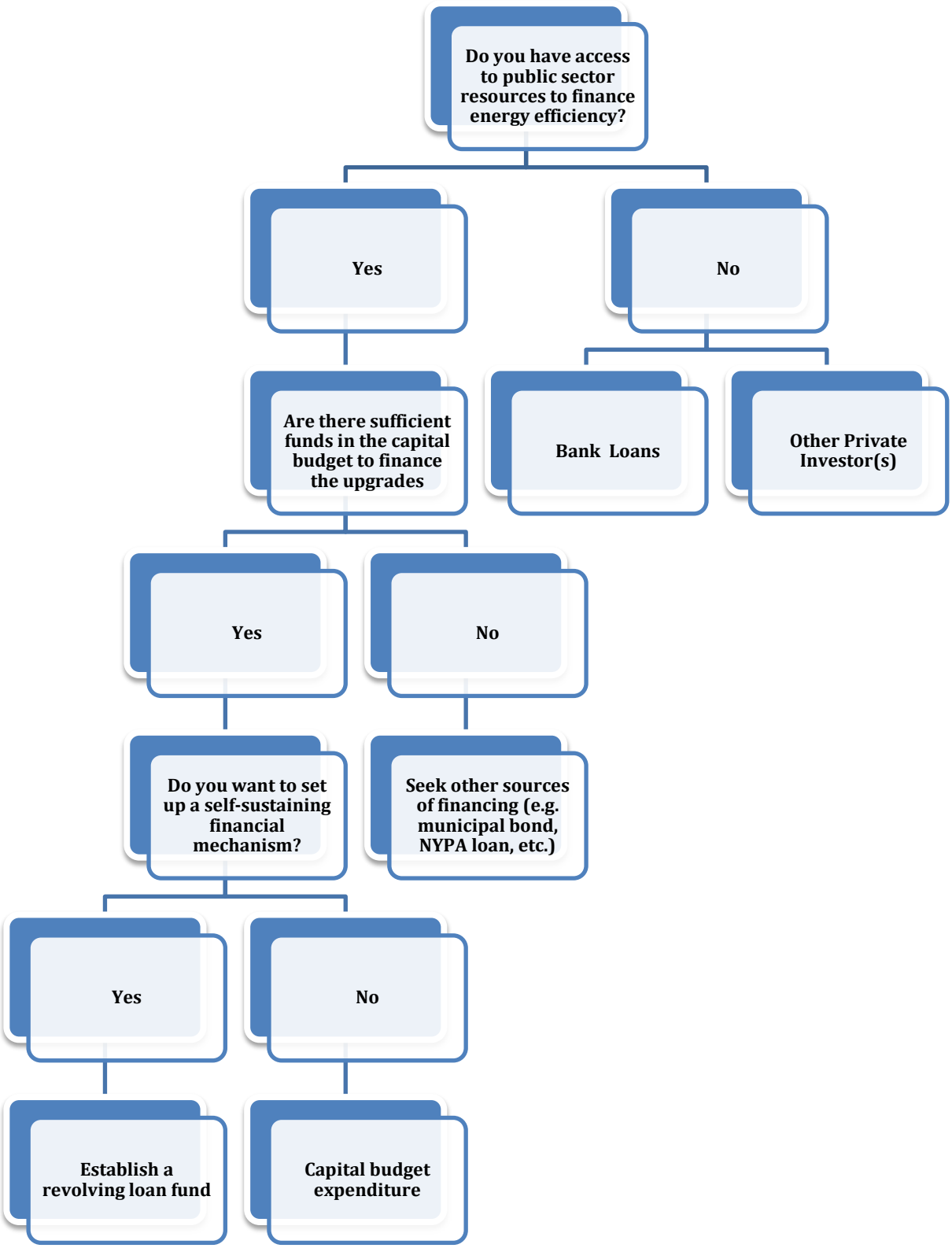
The next section specifically addresses the questions of financing, and attempts to lay out the basic considerations that Albany County should weigh when choosing a financing vehicle.

3. Financing Options and Tradeoffs

As highlighted earlier, there are no hard and fast rules linking a particular performance contracting model to a particular form of funding, such as corporate debt, municipal bonds, or otherwise. One commonality that ESAs and MESAs share is that they are often financed by equity. Beyond this, the various energy efficiency procurement options discussed here can be financed by a range of different vehicles, including capital budgets, loans, bonds, or other special purpose funds. The source of capital should therefore be thought of separately from the actual details of the contracting vehicle (e.g. NYPA energy efficiency program, guaranteed performance contract, etc.).

Figure 6 provides an overview of the basic decision tree of options available.

Figure 6: Decision Tree of Financing Options



As seen in Figure 6, the basic options for financing can be broken down into whether the project is self-financed, or whether financing is provided by an external service provider (e.g. ESCO or by a private entity such as a bank or an equity investor). There are three basic considerations and trade-offs to bear in mind.

1. **Cost of finance:** In many cases, financing upgrades directly out of the capital budget can be the least expensive means of pursuing energy efficiency upgrades because it avoids the mark up to cover project management, as well as the risk premium and corresponding return required by private performance contractors. However, while this may be the cheapest way of financing energy efficiency upgrades it is constrained by the pool of funds available, which limits project size. If larger upgrades are required, it may be necessary to borrow – this becomes a balance between what's cheapest, quickest, and easiest to secure. Bonds typically have lower costs of capital than private debt, but they may take longer to secure. Bank debt may be easier to secure, but comes at a higher cost.
2. **Cost of waiting:** Albany County could opt to wait for the capital budget to accumulate, generating a sufficiently large pool of funds to undertake efficiency upgrades. However, during that time, there are unaddressed inefficiencies that are costing the public money –taking on additional debt may therefore be preferable to waiting several years for sufficient capital funds.[4]
3. **Availability or ease of securing financing:** If borrowing is considered necessary, public debt may be the cheapest, but it also may be difficult to secure. Moreover, it may be difficult to find the political support for new public borrowing to finance energy efficiency upgrades. If this is the case, private debt and equity may be secured more quickly and with fewer transaction costs, which may be particularly important if time is a premium. In this case, a full service option such as an ESA or MESA could also be attractive, despite the price premium.

What is a Revolving Loan Fund?

A revolving loan fund is a pool of money that can be used to offer loans on a self-replenishing basis to a pre-determined set of borrowers. As the borrowers repay the funds borrowed, the money is returned to the pool to enable future loans to be made. Typically, the interest and fees paid by borrowers support program administration, leaving the fund's capital base intact. The Fund lends money with specific goals or borrowers in mind and they are generally administered by government agencies or nonprofits. A revolving loan fund can be capitalized with money from a municipality's capital budget. The loan fund can then be used by Albany County to loan to specific buildings to finance efficiency upgrades. The energy efficiency savings can then be used to recapitalize the fund.

For more information on revolving loan funds for state and local government agencies, see: Booth et al., 2011,

http://www.nrel.gov/tech_deployment/state_local_activities/pdfs/51399.pdf

[4] Zobler, N., & Hatcher, K. (2003). Financing energy efficiency projects. *Government Finance Review, 19*(1), 14-18. See also: http://www2.presidentsclimatecommitment.org/documents/ccitoolkit/Energy_Performance_Contracting_Financing_Options.pdf

4. Key Take Aways for Albany County:

This memo reviewed energy efficiency financing and contracting strategies for Albany County. There are a number of key take aways:

- **Financing.** In terms of sources of capital, Albany County's main choices are its capital budget, municipal bonds, and private debt (e.g. commercial loans). If the capital budget is deemed insufficient, the availability of low cost NYPA financing makes this an attractive option. A further question becomes whether Albany County wants to finance the entire upgrades alone (with NYPA or without), or whether it would prefer to partner with an ESCO to share both the financing and the overall performance risks.

- **Contracting.** Albany County has utilized the NYPA energy efficiency program in the past. The NYPA energy efficiency program addresses the performance risk of energy efficiency measures through upfront engineering and design work – however, it does not include a performance guarantee. Albany County could pursue a performance contract if a performance guarantee is desired and/or if greater procurement flexibility is desired beyond what NYPA currently offers.

- **Balance Sheet Considerations**: One of the key factors shaping the performance contracting industry in the U.S. has been the desire to keep energy efficiency upgrades 'off balance sheet'. As accounting rules are changing, there are emerging contracting mechanisms such as ESAs and MESAs that Albany County could consider if keeping upgrades off balance sheet remains an important concern. These are broadly believed to be more immune to future changes in accounting rules.

- **Performance Risk**: A key advantage of performance contracting is that it reduces the performance risk for Albany County, particularly when compared to a 'design/build' approach. However, if there are strong reservations about the risks, the design/build approach may not be suitable, and it may be advisable to procure the upgrades in conjunction with either of the two traditional ESCO models, or via an ESA or MESA structure.

Ultimately, the choice of financing and performance contracting options depends on Albany County's risk appetite, its overall financial capacity, and the resources and expertise it has on hand. The important point is to be aware of the various options available tradeoffs, and to make the decision on the basis of a broad understanding of the risks, and tradeoffs of different approaches.

Appendix 1: Overview of Innovative Financing Options

The table below provides a snapshot of some of the other innovative financing mechanisms that are commonly discussed. As highlighted in the right column, however, those listed here are not readily applicable to Albany County. They are considered separately here.

Financing Mechanism	Description	Applicability to Albany County
Commercial PACE	Municipalities can provide a loan to building owners and the loan payment is then integrated into the property tax payment and paid back by the building owner over time.	Albany County does not pay property tax on the buildings it owns. Albany County also does not lease a significant amount of space from private owners. As a result, commercial PACE is not a viable option for Albany County.
On-bill financing and on-bill repayment	On-bill financing refers to when a utility provides capital for energy efficiency upgrades, and then the loan payment is integrated into the monthly utility bill. Under on-bill repayment, the utility bill is used as the mechanism for repayment – but a third-party (i.e. not the utility) typically provides the capital.	Albany County cannot currently access on-bill repayment since it is a New York Power Authority (NYPA) customer and NYPA does not offer on-bill financing or on-bill repayment.
Federal tax credit bonds	There have been a range of federal tax credit bonds, such as Qualified Energy Conservation Bonds (QECBs) and Build America Bonds (BABs) that have been used to finance energy efficiency. Local jurisdictions can use these bonds to access capital at low interest rates.	Access to these financing mechanisms through the federal government is no longer available.