

**Accelerating Commercial Building Energy Retrofits: Policy, Best Practices
Compilation, Pilot Implementation**

**FINAL ADMINISTRATIVE REPORT
June 27, 2014**

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INTRODUCTION

The findings of this investigation are contained in a Final Summary Report and a compilation of documents both in a DropBox Shared Folder entitled “Commercial EE Document Library” and a zip folder of the same name. That compilation includes various policy briefs, tutorials, case studies, value propositions, references, model contractual templates, fact sheets, and other resource documents assembled to support the acceleration of energy-efficiency improvements to commercial buildings. Section 2 of this report integrates and organizes these documents.

As part of the Administrative Close-Out of this Grant, DMME has contracted with Clean Energy Solutions, Inc. (CESI) to complete the following work during the remaining grant period between March 1 and June 27, 2014:

- a) to organize and integrate the Commercial Building Energy Efficiency Toolbox resource documents,
- b) to refine the benefits analysis of commercial ESPC use in a graphic form, and
- c) to adapt the DOE “Model” commercial ESPC contracting documents for local use, and make other recommendations concerning use of the compiled resources.

The goal of this work is to deploy the “best practices” compiled during the Grant period, including parallel EERE work on Model Documents, for effective penetration of an under-served market. The Grant Team finds that availability of low-cost financing, incentives, technical information, and proof of high ROIs is not enough to move this market. Internal processes and the personal hopes, fears, needs and suspicions of individual decision-makers must be addressed. That is the purpose of Section 3, “Credibility and Collaterals.”

Section 1. APPLICATIONS AND TARGET AUDIENCE

Five classes of potential users are expected to benefit from this report, in the following ways:

- a) Those considering funding priorities, designing programs, drafting legislation and regulations, and setting or advocating policies—to guide their creation of a more robust financial and marketing environment for energy efficiency (EE) contracting in commercial facilities
- b) Those administering government, utility, foundation, or other EE programs¹—to strengthen the uptake and impact of their programs in commercial markets
- c) Those performing research and publication in publicly-funded R&D and academic settings—to supplement their findings in one of the least-studied markets
- d) Those involved in ESPC financing and contracting—to provide practical tools for efficient marketing and financing
- e) The end-users—to give them confidence in a process they often distrust, and the tools to make judgments and manage engagements at minimal disruption and affordable transaction cost

Who are these end-users? The “commercial market” has been broadly defined in this project (and in many utility programs and rate classifications) to include local jurisdictions engaging ESCOs for their own buildings and public schools. It also includes building owners and managers of:

- Commercial office buildings

¹ Many of these “project leaders’ and energy office representatives have been participating in the “ESPC Model Document” task force convened by Alice Dasek and coordinated by Linda K. Smith.

- Commercially-owned apartments
- Private Nonprofit-owned multifamily facilities
- Condominium boards
- Aggregated small retail businesses (target is the aggregator; e.g., a state program)
- Mall anchor tenants/owners/developers
- Privately owned health centers
- Private schools and colleges
- Retail chains and franchises
- Museums, theatres, other cultural facilities

This is a broad and miscellaneous group. In this report, resources and promotional materials are organized to address common concerns that have impeded their adoption of EE retrofits and practices.

Section 2. ORGANIZATION OF RESOURCES: A LIBRARY OF EE MARKETING AND CONTRACTING DOCUMENTS

Section 2.1 Library of documents

The library of documents organized in this section provides guidance in:

- The key Barriers to penetrating the commercial market
- How to Get to “YES” (developing internal support)
- How to describe the benefits of performance contracting
- How to finance performance contracts (Besides generally-used mechanisms, a survey of PACE legislation and recommendations for adoption in VA and MD are included.)
- How to prepare and manage RFQs, RFPs, and contracts
- How to work with ESCOs, to ensure the customer’s real needs are met

In preparing this library, the Team surveyed, compiled, posted, and conducted training around the Best Practices for commercial markets in MD and VA. The contractual templates gathered are compliant with ESPC legislation in those states. Meanwhile DOE’s “ESPC Model Document” task force of national stakeholders has been developing templates of wider applicability. VA and MD may be best served by adopting these in their prescribed practices. This potential is developed further in Section 4, Recommendations.

a. GUIDE - Getting To “Yes” For Energy Efficiency: A Guide to Developing a Persuasive Business Case for Energy Efficiency in Commercial and Corporate Properties

This Guide is intended for anyone working to implement an energy efficiency project in the commercial or corporate building sectors, referred to as an energy efficiency Champion throughout. It is a “how-to” manual for moving energy efficiency projects through an organization’s decision-making process. Using the Guide is a dynamic process and depending on whether you are just beginning to develop a project or you are encountering obstacles, different sections will provide guidance for wherever you are in the process.

Section 1 – “Preparing for Success” – outlines the key steps in identifying team members needed to support the project. It provides insight on how to position the project as it relates to the needs of the other team members and suggests language that will

resonate with them. By quantifying the cost of delay, it underscores the argument that time is of the essence when dealing with energy efficiency.

Section 2 – “Clearing the Hurdles” – identifies the most common objections heard when proposing an energy efficiency project. It includes a range of common organization and financial hurdles. Specific tools and resources for addressing each hurdle are suggested.

Section 3 – “Training for Success” – provides more detailed definitions or terms and concepts used in this Guide, along with in-depth explanations of the suggested strategies.

Section 4 – “Resources and Appendices” - is a list of key resources and links that provide additional information relevant to the focus of the Guide. Particular attention should be given to Appendix A, “Complete Hurdles Table,” which presents the most common hurdles along with tools to address each one.

b. PRESENTATION - Building a Persuasive Business Case for Energy Efficiency

This presentation is a companion to the Getting to “Yes” For Energy Efficiency Guide for Commercial and Corporate properties. It provides an overview of the basic elements needed to build a successful project.

The case studies present successful projects at a commercial business, a public school system and a medical center. They provide a step-by-step description of the project process, which follows the Getting to “Yes” Guide as well as lessons learned from the energy efficiency champion. Several of the lessons learned echoed across all the case studies are as follows:

- Get started with an energy audit
- Utilize outside resources such as utility rebates and state incentives
- Gather quality data from the outset to be able to document savings from the project
- Garner support from all possible stakeholders by justifying energy-related improvements beyond their obvious cost savings

c. CASE STUDY - Getting to “Yes” for Energy Efficiency: Westminster Riding Club – *How a Historic Maryland Social Club Overcame Hurdles to Harness Energy Efficiency*

A case study of a commercial business that needed to replace a failing, 35 year old HVAC system and ultimately designed a project to address other energy efficiency and capital needs. The project integrates utility and state incentives, saving approximately \$7,600 a year with a simple payback of less than 9 years.

d. CASE STUDY – Getting to “Yes” for Energy Efficiency: Harford County Public Schools – *A Maryland Public School System Invests in Energy Efficiency and Renewable Energy to Improve Facilities, Manage Costs, and Set an Example for the Next Generation*

A case study of a public school system that has been able to save many millions of dollars through lower energy bills, more efficient operations and reduced maintenance costs. The larger project facilitated by the EPC with Johnson Controls (JCI), guaranteed for 15 years, will save over 7.2 million kWh, 109,000 gallons of heating oil, and 3.4 million gallons of water and almost \$200,000 annually.

e. CASE STUDY – Getting to “Yes” for Energy Efficiency: Anne Arundel Medical Center – A Leading Maryland Hospital Invests in Energy and Conservation to Improve Facilities, Manage Costs, and Set an Example for Facilities in Health Care and Other Industries

Anne Arundel Medical Center is one of Maryland’s largest community hospitals, serving a regional population of about one million in Annapolis and surrounding areas. Over the years AAMC has been recognized for conservation and sustainability. The Center continues to incorporate energy efficiency into many of the major capital equipment upgrades and building expansions undertaken in the past three years.

f. GUIDE - Business Case for Energy Efficiency in Public Schools

The business case for energy efficiency in public school systems is obvious from a cost saving standpoint. Substantial energy-saving and water-saving opportunities exist in most school facilities, on the order of 60 cents per square foot per year saved for an investment on the order of \$3/sq. ft. The 5-year simple payback supports most forms of financing because the savings easily exceed debt service. However, marketing must focus on the personal needs and concerns of individual decision-makers and with recognition of the difference between the subsectors. Generally, the Public Schools market sector is distinguished from colleges, universities, and private schools. This distinction is based primarily on campus configuration and governance. Although all are in the education business, public schools have a very different set of decision-makers, budgeting and procurement processes than do university campuses, and typically different energy system designs.

This Guide includes a public school sector overview; typical energy efficiency measures applicable to school buildings; case studies and additional resources; and recommendations based on lessons learned and best practices.

g. FACT SHEET – Green Leasing: Why Incorporate Sustainability Improvements into the Lease?

“Green Leasing” helps to overcome some of the barriers to financing energy efficiency in buildings where landlord and tenant interests diverge, through some means of sharing benefits, risks, and costs. Associated benefits of incorporating sustainability improvements into a lease are as follows:

- Lower operating expenses
- Increased occupancy and base rents
- Meet corporate sustainability goals
- Improve employee productivity
- Attract and retain employees

- Anticipate future regulations

This fact sheet explains what green leasing is; provides resources; makes policy recommendations; and provides examples of green leases from both the federal government and local Virginia and Maryland companies.

h. GUIDE - Commercial EPC Guide: What To do Once You Have Decided to do an Energy Performance Contract

Getting to “Yes” is an excellent guide to align stakeholders around the benefits of energy efficiency measure investment in multifamily, commercial and industrial buildings. The review of “Getting to Yes” is the best starting point for individuals and groups interested in pursuing an investment to reduce utility bills and improve energy usage in buildings.

This guide is designed to advise groups that have made the decision to move forward with an energy efficient project in a building in excess of 20,000 Sq Ft and have decided to employ Energy Performance Contracting, a specific type of financing tool available to larger properties. The guide was written by EPC professionals with over 60 years combined experience and it shares information not generally found in existing guides. The goal is to highlight key contractual considerations for owners and property managers based on practical experience in the field.

Section I: a history of energy performance contracts.

Section II: a step-by-step guide to energy performance contracts

Step 1: Approving the work plan

Step 2: Negotiating costs and guaranteed savings

Step 3: Negotiating other terms of the final contract

i. CONTRACT TEMPLATES

As discussed in the Commercial EPC Guide, energy efficiency projects in buildings in excess of 20,000 Sq Ft can often benefit from energy performance contracting to finance the project. This Guide provides step-by-step instructions for completing an EPC, including negotiating the numerous contracts involved. Several sources of good contract templates are provided: Energy Services Companies (ESCOs) typically bring their own contracts to the table, but the customer is advised to review key terms carefully. States that have EPC programs have required contract templates required for state agency use and recommended for others; these typically have been largely derived from the Energy Services Coalition model contract templates. Such contract templates have been vetted by the state administration from the customer’s viewpoint.

Through this grant various model contract templates were pulled together as resources for commercial property owners to access once an EPC was decided upon. In addition to the documents provided in this report, the Department of Energy (DOE) has just completed a set of model contract documents available to all building sectors. These documents build upon and update the current ESC model contract documents based on feedback from a broad stakeholder group. While these documents are not available yet, we recommend

their adoption in the future. More discussion of the DOE model contract documents may be found in the section 4, Recommendations.

Following is the list of contract templates compiled and reviewed under this grant:

- a) Template Umbrella Prequalification
- b) Template Investment Grade Audit (IGA) RFQ
- c) Template IGA Contract (BOMA-CCI)
- d) Template ESCO RFQ/RFP (BOMA-CCI)
- e) Template ESCO RFP (MD DGS)*
- f) Template ESCO RFP (VA DGS)*
- g) Template Energy Services RFP (ESC)
- h) Template ESPC (BOMA)

* The MD and VA contract templates have been included as examples but no recommendation is being made to use them as model contract documents.

j. POLICY BRIEF - Commercial Program Barriers and Strategies to Overcome Them

This brief outlines barriers, a 5 year strategy, and recommended policies for creation of a robust energy efficiency market in commercial buildings. The brief lists and explains four categories of state legislation and regulatory policy that can best advance energy efficiency, including commercial and multifamily buildings:

1. Adequate funding for utility incentives to energy efficiency
2. Accessible, affordable financing programs
3. Building and appliance codes and standards
4. Tax credits and deductions

Additionally, there are a number of ways city councils and local elected officials can inspire energy efficiency investments in commercial and residential buildings. A number of them are listed:

1. Property tax abatements for both new and existing buildings, based on EE, such as LEEDs Silver or better
2. Fee waivers, and accelerated permitting for zoning and construction permits associated with capital improvements
3. Dedicated funding to EE programming, such as designating a parking fee increase to the local EE program
4. Financing programs: Tie Business Economic Development low interest loan fund extant in many communities to requirement for energy audit and implementation of all five year payback ECMs
5. Mandatory benchmarking for all city buildings
6. ICLEI Committee formation (or Sustainable Community Board), setting community-wide climate change goals, and strategic 5 year plan to energy reductions, featuring top civic, corporate leaders in the municipality

7. Formation of Corporate EE Voluntary Board to consider Green Leases, voluntary benchmarking, competitions for EE reductions, and subcommittees established for each market subsector
8. Appointment of an Energy Manager in local Government, as well as Sustainability Manager

k. RESOURCE – Appendix A: Using Tax Incentives To Finance Renewable Energy Projects (Reznick Group)

A presentation explaining the different federal tax incentives and the differences among those specifically used to fund renewable energy projects. While this document discusses renewable energy projects, many of these same incentives can be used for other energy conservation measures. The incentives covered are:

- Tax credits
- Income Tax Exclusions
- Deductions: Energy Efficient Commercial Buildings Deduction, Accelerated Deductions, and Bonus Depreciation

l. RESOURCE – Commercial Building Energy Training Centers for Facility Managers

This resource guide is for facility managers, maintenance personnel and property managers to find and access a number of professional, high quality training resources from national, regional and state organizations. Through research and talking to facility professionals, four organizations with varying offerings were identified: in-person and online training, credentials, books, periodicals, and workshops. The four vary considerably in their approaches, curricula and target audiences. The guide contains descriptions as well as websites for the various programs.

m. FACT SHEET – Building Energy Benchmarking: Managing What you Measure

The first step to a more energy efficient building is benchmarking, a process of assessing energy performance relative to a baseline. Benchmarking puts critical information in the hands of building owners and operators, allowing them to measure and track energy performance over time, identify opportunities to improve energy performance, prioritize energy efficiency investments, and evaluate the effectiveness of implemented measures. The fact sheet includes the basics of benchmarking, tools, the benefits and national examples of policies and programs including examples in both Virginia and Maryland.

n. POLICY BRIEF – Commercial Building Energy Benchmarking and Labeling: Implementing a Voluntary Program in Northern Virginia

Building on the Benchmarking Fact Sheet and the policy recommendations to create a robust commercial building energy efficiency market, this policy brief focuses on the elements and steps to creating a voluntary benchmarking program in Northern Virginia. The brief includes the rationale for a voluntary program; data privacy considerations; the target audience; administrative requirements; necessary technology infrastructure; partner and trade organizations and a marketing plan.

o. POLICY BRIEF – Statewide Commercial PACE Administrative Framework

Property Assessed Clean Energy (PACE) is a financing mechanism that holds significant promise for expanding investment in energy efficiency in the commercial sector. Part of the grant resources were used to work on an improved PACE statute for Virginia and to advise public and private stakeholders in this opportunity. This policy brief outlines and recommends the creation of a statewide commercial PACE administrative framework. The brief includes:

Section I: Program structure, mission and relationship to state government

Section II: Financing and the role of the administrator

Section III: Program design attributes

Section IV: Recommendations

Section V: Additional Resources

p. RESOURCE – PACE Program Matrix

The matrix is a supplement to the Statewide Commercial PACE Administrative Framework. The matrix provides programmatic details from administrative structure to audit requirements and marketing strategies of different state and local PACE programs across the country.

Section 2.2 Library Document User Matrix

The matrix below lists all of the documents compiled for the grant, categorized by type. The potential users of the documents have been listed along with which documents could be helpful for the individual users.

	TITLE	facility managers	property owners	sustainability/energy managers	energy auditors/contractors	state government	local government	program administrators	financial institutions	property managers	utilities
GUIDE	Getting to "Yes" for Energy Efficiency	x	x	x	x	x	x	x		x	
PRESENTATION	Building a Persuasive Business Case for Energy Efficiency	x		x		x	x	x		x	
CASE STUDY	Getting to "Yes" for Energy Efficiency: Westminster Riding Club	x	x		x			x	x	x	
CASE STUDY	Getting to "Yes" for Energy Efficiency: Harford Public Schools	x	x	x	x		x	x	x	x	
CASE STUDY	Getting to "Yes" for Energy Efficiency: Anne Arundel Medical Center	x	x	x	x			x	x	x	
GUIDE	Business Case for Energy Efficiency in Public Schools		x	x	x		x	x	x		
FACT SHEET	Green Leasing: Why Incorporate Sustainability Improvements into the Lease?		x			x	x	x	x	x	
GUIDE	Commercial EPC Guide: What to do Once You Have Decided to do an Energy Performance Contract	x	x	x	x	x	x	x	x	x	
CONTRACT	Contract Templates										
CONTRACT	Template Umbrella Prequalification					x	x	x			x
CONTRACT	Template IGA RFQ		x		x	x	x	x			
CONTRACT	Template IGA Contract (BOMA-CCI)		x		x	x	x	x			
CONTRACT	Template ESCO RFQ/RFP (BOMA-CCI)		x		x	x	x	x			
CONTRACT	Template ESCO RFP (MD DGS)*				x	x	x	x			
CONTRACT	Template ESCO RFP (VA DGS)*				x	x	x	x			
CONTRACT	Template Energy Services RFP (ESC)		x		x	x	x	x			
CONTRACT	Template ESPC (BOMA)		x		x	x	x	x			
POLICY BRIEF	Commercial Program Barriers and Strategies to Overcome Them			x		x	x	x			x
RESOURCE	Using Tax Incentives to Finance Renewable Energy Projects		x	x	x			x	x	x	x
RESOURCE	Commercial Building Energy Training Centers for Facility Managers	x	x	x		x	x	x		x	
FACT SHEET	Building Energy Benchmarking: Managing What you Measure	x	x	x		x	x	x		x	
POLICY BRIEF	Commercial Building Energy Benchmarking and Labeling: Implementing a Voluntary Program in Northern Virginia	x		x		x	x	x			
POLICY BRIEF	Statewide Commercial PACE Administrative Framework		x	x		x	x	x	x	x	
RESOURCE	PACE Program Matrix				x	x	x	x	x		

Section 3. CREDIBILITY AND COLLATERALS

The “business case” for performance contracting, and consequent marketing materials, are developed in this section. It compiles the weight of evidence from data bases and case studies, allowing benchmarking and building confidence in potential. It is presented in the form of slides suitable for

presentation to novice or experienced ESPC users, rendering the materials from Section 2 in a composite and digestible form. Two slide decks are presented, one comprehensive and one summary.

The slides include a reference and explanation of a combined database and “dashboard” tool—eProjectBuilder (ePB)—about to be released by DOE and LBNL. For a customer with a single project at their facility, ePB will provide a useful “dashboard.” For government or utility administrators of EE programs, (someone with a program and multiple projects), the “dashboard” will have to be somewhat richer. Such an enhanced tool is under development in Task 4 of the 2012 Competitive SEP Award to VA (DMME DE-FOA-0000650).

The slides can be found in Appendix A (Comprehensive) and Appendix B (Summary). Additionally they are provided in the shared Dropbox folder referenced in the introduction in powerpoint format and therefore easily adapted for individual presentations.

Section 4. RECOMMENDATIONS

This Section summarizes the Team’s recommendations in the three key areas of Management, Marketing, and Financing of Commercial Market penetration.

4.1 Management and Model Documents

Administrators and policy-makers, whether at the federal, state, or local level, struggle to accommodate the sometimes-opposing interests of energy consumers and energy contractors. That management imperative is especially challenging in attempting to accelerate penetration of commercial markets, where private interests generally take precedence over public or socialized benefit, and where time horizons are comparatively short. The Team has therefore attempted to elucidate shared goals and to provide mutually-acceptable resources to support that accommodation.

Section 2 compiles the key resource documents developed to support commercial market penetration. In a parallel effort, EERE has sponsored a “Model Contract Documents” project engaging representative stakeholders with a national perspective. The third and final phase of this effort has just concluded and the process of internal vetting and then posting is proceeding. These documents are important for the following reasons:

- They reflect a broad consensus among the stakeholders most involved in actual implementation of EE/RE design, installation, commissioning, and financing²
- They emerge from a State-driven process and integrate 30 years of state experience administering ESPCs; of 11 states surveyed, there was unanimous support for a standardized process
- They incorporate updated best practices in 8 key challenges: financing, ESCO qualification, pricing, project management, auditing, guarantees, M&V, and data reporting
- They are backed by the largest database of successful ESPCs³ and include a requirement that ESCOs continue to contribute key data on new contracts

² Approximately 40 professionals participated in this project, drawn from leaders in banking, commissioning, and energy efficiency organizations including FEMP, DOE, NAESCO, LBNL, ESC, and 8 State Energy Offices.

Recommendation:

Virginia and Maryland will be best served by adopting the DOE Model Documents in procuring and administering ESPCs for state agencies and advising local agencies in their use. The Project Team surveyed, compiled, posted, and conducted training around “best practices” for Commercial markets in VA and MD. These are compliant with ESPC legislation in those states, but they are applied inconsistently and subject to frequent change. Adopting the DOE models, including their continued evolution and ties to databases such as eProjectBuilder, will streamline the approval process and strengthen credibility.

4.2 Marketing and Commercial Market Barriers

The commercial market is characterized by short time horizons, resistance to distraction from the core business, widely-diverse technologies, distrust of interference, sensitivity to competition, and the high transaction costs of reaching many scattered operations. Often decision-makers within a single customer have opposing interests, as for example tenants vs. owners, associations of condominium owners, stockholders vs. operators, unions vs. management, etc. Opportunities for aggregating sufficient numbers of smaller customers are rare and challenging because of such diverse interests. Graphic evidence of all these difficulties can be quickly seen in the paucity of successful ESPC case studies from commercial engagements.

Recommendation:

Section 3 provides slides and references to interactive materials designed with this market in mind. Their use must be focused on individual decision-makers, avoiding the common error of assuming an “organization” is monolithic, and addressing personal hopes and fears, benefits and risks, short planning horizons and attention spans.

4.3 Financing and PACE

Section 2.o and 2.p describe the concept, uses, administration, and benefits of “property-assessed clean energy” (PACE) financing.

The availability of PACE financing directly confronts and sometimes solves one of the major marketing barriers: the persistent sense of imminent change, whether in operations, facility use, ownership/management, markets/competition, financial vitality, technology, regulations, or unpredictable exogenous factors. A PACE-based debt attaches to the facility, not its owner. Thus decision-makers can feel some safety in making a commitment that has a longer term than their expectations. In addition, if well administered, PACE financing can be relatively quick and hassle-free, and may involve relatively flexible underwriting criteria. It is focused entirely on providing local tax-based debt placement and service for energy efficiency and renewable-energy installations.

³ See Section 3

Recommendation:

Advocate for passage of PACE-enabling laws and regulations, and for funding of a central administrative and technical assistance organization to provide consistent and convenient support, as described in Section 2.

**APPENDIX A: Energy Strategies that Support Commercial Building Performance Improvement
(Comprehensive Presentation)**

Energy Strategies

that Support Commercial Building Performance Improvement

Prepared for

Prepared by

Date

Introduction

Improving building energy performance results in multiple benefits for building owners and managers

- Increases equipment reliability and reduces risk of sudden catastrophic failures
- Lowers maintenance and repair expense
- Creates a buffer against high or volatile energy cost
- Generates a source of funds for future infrastructure renewal
- Eliminates comfort complaints and increases productivity
- Increases tenant satisfaction and retention

This guide describes a comprehensive energy strategy to improve efficiency and address building renewal needs

2

STRATEGIES to improve energy performance

- Attention to **where, when, and how** energy is used
- Proper and timely equipment and system **maintenance**
- **Replacing** old, inefficient equipment with new, more efficient equipment and systems
- Installing **computerized energy control systems** to automate temperature setbacks and equipment scheduling
- Considering “**life cycle cost**” rather than “first cost” when purchasing major equipment
- Making “**energy impact**” a criterion in all decision making

3

Energy needs assessment:

What are **YOUR** needs and concerns?

- **Lowering** energy use and expense?
- **Reducing** comfort calls and complaints?
- **Finding funds** for equipment upgrades?
- Getting **expert assistance** to identify projects?
- **Deciding** what to do first or next?
- **Engaging contractors** you can trust?
- **Leveraging limited staff time** to manage new projects?

4

Typical BARRIERS to energy improvements

- We don't know what to do
- We don't know how to do it
- We don't have (or can't get) the resources now, but making improvements is in our "long term plan"
- We don't have enough staff
- We don't have enough time
- We don't have enough money
- We don't have the right expertise
- It sounds too good to be true
- It's not worth the investment

5

Which of these strategies for improving energy efficiency in operations do you use?

Wait until equipment fails

... and then, if there's time, try to replace it with something better?

Tap excess internal funds in multi-year budgets

... to do a little and save a little each year?

Participate in utility programs

... to get some incentive dollars and "skim the cream"?

Not think about energy use

... until a vendor tries to sell me on something that will save me money?

6

If you could find an easy way to...

- Get a technical expert to identify / evaluate energy projects
- Complete both energy efficiency projects and hard-to-fund infrastructure replacement projects
- Give an expert responsibility to design and install the work
- Install these many improvements in a short period of time
- Have all work fully commissioned to your satisfaction
- Structure the deal so the project is self-funded from savings
- Have the savings guaranteed over the full term of financing

Would you be interested?

7

Consider an Energy Performance Contract

An Energy Performance Contract or “EPC” is a tool to **reduce** energy use and expense *and* **modernize** energy infrastructure.

Annual savings over the term of the contract pay capital costs for energy improvements, making a project **self-funding**.

Specialized contractors called **Energy Services Companies** or ESCOs do this work.

The ESCO helps identify advantageous sources of **up-front capital** and any **subsidies** that may be applicable.

8

EPCs are being used widely by...

- The U.S. government at **military bases, veterans hospitals, office buildings and complexes**
- State governments at **universities, state hospitals, offices**
- Private schools and colleges
- Cities and towns and school districts
- Multi-unit housing complexes
- Commercial buildings

9

Why have EPC users chosen **this** strategy?

They need energy use reduction *and* infrastructure renewal

In addition, they want to

- Reduce operating costs and improve reliability
- Improve occupant comfort
- Increase employee productivity

In commercial real estate, they also hope to

- Improve tenant satisfaction
- Increase tenant retention
- Make the building more competitive

They need the technical expertise that ESCOs bring

They can fund these EPCs using savings in operating budgets

10

What else makes this approach **attractive**?

- EPCs permit an owner to **dictate project goals and parameters**
- They **follow a formal process** for energy audits, design, construction, commissioning, and savings verification
- **Publicly-vetted contracts are available** to adapt and use
- Contracts can provide **procurement transparency** with competitive bidding and use of favored sub-contractors
- ESCO brings both **technical and project management expertise**
- Private lenders will **finance** projects based on guarantees

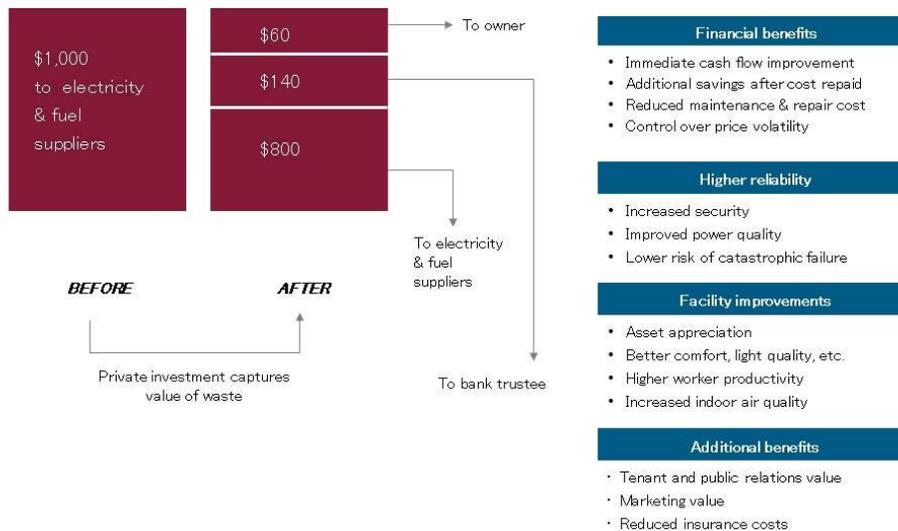
11

EPCs address all energy- & water-related equipment and systems

- Lighting upgrades, re-design, and replacement (interior & exterior)
- Electrical systems, motors and drives, pumps and fans, compressors
- Water conservation, including re-use of stormwater & wastewater
- Boilers, chillers, and other heating and cooling technologies
- Air handling units and heat and cooling distribution
- Building and energy management systems and controls
- Combined heat and power generation, fuel cells, etc.
- Insulation, air infiltration reduction, windows, doors
- Renewable energy, including solar and geothermal
- Energy conversion and storage
- Refrigeration

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EPC Customer Value Proposition



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Who gets the EPC benefits?

Owner lowers operating costs and increases building value, *with no out-of-pocket expense*

Asset Manager increases equipment reliability, improves building control, reduces repairs, *and has fewer tenant calls and complaints*

Operations team has newer systems to operate and maintain, better equipment documentation, and O&M training

Occupants and tenants are more comfortable and have better air quality, increased productivity, and more reasons not to look for someplace better

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What ESCOs look for in a project

ESCOs may have different **specialties**
(e.g. schools vs. housing)

ESCOs also may have **targets** for the size
project they want

All ESCOs look for

- Excessive energy and water use
- Higher than market utility costs
- Opportunities for savings and investment
- Stable facility use and ownership
- Needed asset modernization projects

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What ESCOs look for in a customer

An owner willing to **identify** all relevant
decision makers and **share** what they
care about

Owner sets **expectations for employees**
who are participants

Financial strength to proceed with the
project

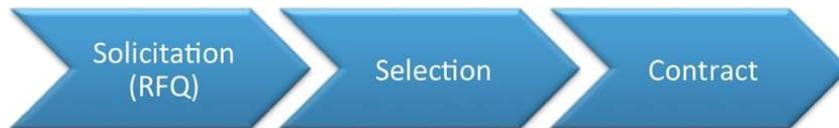
Willingness to enter into a **long-term**
agreement

Buy in, cooperation, and commitment to
the effort across
the customer organization

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Finding your ESCO:

Issue a Request for Qualifications (RFQ)



1. Identify potential bidders
2. Issue RFQ addressing experience, capabilities, approach, pricing
3. Evaluate proposals, interview short list, identify preferred ESCO
4. Contract with preferred ESCO for development phase

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Qualifications to look for in an ESCO

- ▶ **Track record** in similar buildings and with similar clients
- ▶ Customer **references** and **testimonials**
- ▶ **Financial strength**
- ▶ **Technical strength** and **project management** capabilities
- ▶ **Creativity** and ability to solve problems
- ▶ **Fairness** in pricing
- ▶ **Communications** skills
- ▶ Good **chemistry** with your team

18

Go it alone or...

engage an Owner's Agent?

Most owners in EPCs are doing them for the first time. They often hire an EPC Owner's Agent to support them. The Owner's Agent:

- Sits on your side of the table with your team
- Brings extensive understanding of EPC
- Provides energy engineering that the owner's team lacks
- Advises the owner's team on technical and process issues
- Has the goal of optimizing the value created for the owner
- Can assist with explaining the deal to other stakeholders

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Qualifications of a good Owner's Agent

- ▶ Excellent **communications** skills
- ▶ Prior **experience** with performance contracting
- ▶ **Understands** the roles and responsibilities of parties
- ▶ **Technical expertise** in HVAC, building controls, lighting
- ▶ Design review, construction, commissioning **experience**
- ▶ **Demonstrated ability** to measure and verify savings
- ▶ **References and testimonials**

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Potential Owner's Agent roles

Support ESCO selection

Critique audit results and ESCO proposal

Help **sell** the project to other stakeholders

Help **finalize** contract terms and conditions

Review design submittals and **resolve** construction issues

Witness commissioning, with focus on HVAC and controls

Verify that annual savings guarantees have been met

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Structuring an Owner's Agent engagement

- Establish an hourly rate
- Develop a scope of work, with not-to-exceed amounts by task
- Explore rolling the Owner's Agent cost into the EPC
- Use the initial first-year savings to help pay for design review, construction support, commissioning oversight
- Use annual energy savings in the operating budget to support the ongoing review of M&V reports

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The stages of the EPC process



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EPC Stage 1: DEVELOPMENT



1. Confirm goals / priorities with ESCO
2. Proceed with and support preliminary audit
3. Consider engaging an Owner's Agent to assist with the process
4. Review suggested projects and project economics
5. Ask ESCO for detailed audit of preferred projects and proposal **OR**
6. Abandon the effort if preliminary findings are not attractive
7. Consider ESCO project proposal and request refinements
8. Proceed to construction **OR** disengage

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EPC Stage 1: DEVELOPMENT

Establish what you hope to accomplish and any other project requirements

- Energy use reduction?
- Infrastructure modernization?
- Facilities to target?
- Priority projects and improvements?
- Project time constraints?
- Coordination needs with other initiatives?
- Contract term limitations?

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EPC Stage 1: DEVELOPMENT

How can the EPC protect the owner against performance problems?

EPCs provide protections throughout the ESCO engagement

- | | |
|---------------------------|---|
| • Price assurance | ESCO mark-ups can be set during selection process |
| • Transparency | Project costs can be “open book” |
| • Competitive pricing | ESCO can be required to get multiple bids |
| • Subcontractor selection | Owner decides what firms are preferred |
| • Comfort and schedule | Comfort settings are determined by owner |
| • Design review | Owner must approve all final design submittals |
| • Commissioning | Installations must function to owner’s satisfaction |
| • Warranties | Provided both by ESCO and from manufacturers |
| • Energy savings | Annual savings measured, verified, and guaranteed |
| • Performance bonds | Can be required from ESCO to protect owner |

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EPC Stage 1: DEVELOPMENT

There are also many owner “off-ramps” with EPC

- **After the preliminary audit** – If ESCO finds no projects of interest, owner can disengage at no cost
- **After detailed audit** – If owner chooses not to proceed with ESCO proposal, owner can pay the audit fee and disengage
- **Prior to executing the construction contract** – If owner does not secure financing, owner can pay for the audit and disengage
- **During design** – If discovered conditions make a project impractical, work can cease and owner pays ESCO’s cost incurred
- **After ESCO receives construction bids** – If total price exceeds not-to-exceed limit, owner can reduce scope and pay ESCO’s cost incurred

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EPC Stage 2: DESIGN & CONSTRUCTION



1. Execute a design / build construction contract
2. Create a Construction Management Team to work with the ESCO
3. Critique and approve design submittals and specifications
4. Select preferred ESCO sub-contractors
5. Monitor project progress
6. Witness commissioning

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EPC Stage 2: DESIGN & CONSTRUCTION

Cash flows & financing

- EPC' s are by definition self-funding, **BUT**
 - ESCOs need progress payments during construction
 - ESCOs expect full payment upon commissioning
- A source of capital is required to pay construction costs
- If funds are borrowed, annual project savings will determine the length of term needed to cover capital cost and interest
- Annual savings from project should meet or exceed annual finance payments
- Savings retained in operating budget can be used for payments

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EPC Stage 2: DESIGN & CONSTRUCTION

Sources of EPC project financing

- Bonding (public entities)
- Tax exempt municipal lease (cities and towns)
- Borrowing from endowments (private schools and colleges)
- Commercial lenders (for commercial real estate)
- ESCOs (who can help identify additional funding sources)
- PACE (where it has been authorized by local government)

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EPC Stage 2: DESIGN & CONSTRUCTION

What is PACE?

- PACE stands for “Property Assessed Clean Energy”
- Adopted by a number of states and municipalities as a means to finance building energy efficiency and renewable energy
- Owners identify energy saving opportunities and receive 100% financing from the municipality, raised through bonding
- Funds repaid as a property tax assessment for up to 20 years.
- The debt attaches to the building as a lien, not to the owner

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EPC Stage 3: PERFORMANCE



1. Commissioning is the first performance check as well as the last step in construction. It confirms fully functional performance and starts the warranty clock
2. Pre- and post-construction testing confirm reductions
3. Measurement & verification (M&V) confirms guaranteed savings are being achieved

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EPC CASE STUDY: SCHOOL DISTRICT

Harford County Public Schools, MD

Project costs \$16 million, with 15 year ESCO savings guarantee

Baltimore Gas & Electric provides \$1 million in rebates

Savings:

- Electricity: 7.2 million kWh
- Heating oil: 109,000 gallons
- Water: 3.4 million gallons

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EPC CASE STUDY: MUNICIPAL FACILITIES AND SCHOOLS

Framingham, MA: 15% energy reduction

Overview

- Project costs totaled \$5,966,000, less \$560,000 in utility rebates
- Year one savings totaled \$438,000, with a payback of 12+ years
- Financed with 15-year municipal lease, with 15-year ESCO savings guarantee

Benefits

Town achieves 15% energy reduction goal; state-of-the-art equipment installed with no tax rate impact; project is self-funding from savings in operations budget

Energy improvements

Convert 4,800 streetlights to LED; new, integrated controls in multiple buildings; replacement boilers and other HVAC equipment; lighting upgrades; envelope

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Next steps to take for energy improvement

- Consider **where, when, and how** energy is used
- Make “**energy impact**” a criterion in all future decision making
- **Inventory energy improvements** made in the last 5 years
- Determine where equipment repair **costs have increased**
- Inventory occupant **comfort complaints**
- **Identify old, inefficient equipment** you may want to replace before it fails at an inconvenient time
- Decide what you **want to accomplish** and in what time frame
- **Identify available resources** and embark on your strategy

35



eProjectBuilder

A secure, web-based data entry and tracking system for energy savings performance contract projects, ePB makes it easier to negotiate and track projects

Key benefits:

- Provides instant and transparent access to ESPC project information
- Generates schedule of costs and savings, by measure, for an entire project
- Benchmarks the performance of a proposed project against historical data from other projects
- Delivers streamlined and standardized ESPC data collection

Developed and managed on behalf of the Department of Energy's Federal Energy Management Program (FEMP) by the University of California / Lawrence Berkeley National Laboratory (LBNL).

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Project negotiation and contracting

How it works

- ESCOs input key financial and energy-savings features
- The system generates the full set of financial schedules, including cost savings and contractor payments by year, price by measure, and cash flows
- ESCOs and their customers can then view and negotiate the mix of measures and the key assumptions
- Once finalized, the ePB schedules can be downloaded and inserted into contract documents

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Streamlined project input

Two methods of data entry

1. Microsoft Excel-based template that is uploaded into the system
2. Online form where

- ESCOs can enter information and model project cash flow
- ESPC customers can model scenarios

SCHEDULE #1 COST SAVINGS AND CONTRACTOR PAYMENTS			
	(a)	(b)	(c)
Implementation Period:	Estimated Cost Savings	Guaranteed Cost Savings	Contractor Payments
End of Performance Period (Year):	(d) Estimated Annual Cost Savings	(e) Guaranteed Annual Cost Savings	(f) Annual Contractor Payments
1			
2			
3			
4			
5			
6			
7			

Schedule 1 from ePB data upload template

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Benchmarking

Aggregated ESCO project data from the LBNL/NAESCO project database, the largest database of ESCO project information in the world, enables benchmarking of proposed projects against historic data from actual projects

Performance metrics include:

- Total project costs (\$/ft²)
- Simple payback time (years)
- Annual energy savings (kBtu/ft², kWh/ft², % of baseline energy)



White line is the median

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More information

EMAIL: esco_database@dante.lbl.gov

WEB: <http://energy.gov/eere/femp/energy-savings-performance-contracts>

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Resources for more information

National Association of Energy Services Companies (NAESCO)

www.naesco.org

Energy Services Coalition

www.energyservicescoaliton.org

Building Owners and Managers Association (BOMA)

www.boma.org/sustainability/info-resources

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Maryland Energy Efficiency Project Success Stories

<http://energy.maryland.gov/News/press/successStories.html>

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APPENDIX B:

Energy Strategies that Support Commercial Building Performance Improvement (Summary Presentation)

Energy Strategies that Support Commercial Building Performance Improvement

Prepared for

Prepared by

Date

Introduction

Improving building energy performance results in multiple benefits for commercial building owners and managers

- **Increases** equipment reliability and reduces risk of sudden catastrophic failures
- **Lowers** maintenance and repair expense
- **Creates** a buffer against high or volatile energy cost
- **Generates** a source of funds for future infrastructure renewal
- **Eliminates** comfort complaints and increases productivity
- **Increases** tenant satisfaction and retention

This presentation describes a comprehensive energy strategy to improve efficiency and address building renewal needs

2

STRATEGIES to improve energy performance

- Attention to **where, when, and how** energy is used
- Proper and timely equipment and system **maintenance**
- **Replace** old, inefficient equipment with new, more efficient equipment and systems
- Install **computerized energy control systems** to automate temperature setbacks and equipment scheduling
- Consider “**life cycle cost**” rather than “first cost” when purchasing major equipment
- Make “**energy impact**” a criterion in all decision making

3

Typical BARRIERS to energy improvements

- We don't know what to do
- We don't know how to do it
- We don't have (or can't get) the resources now, but making improvements is in our “long term plan”
- We don't have enough staff
- We don't have enough time
- We don't have enough money
- We don't have the right expertise
- It sounds too good to be true
- It's not worth the investment

4

If you could find an easy way to...

- Get a technical expert to identify / evaluate energy projects
- Complete both energy efficiency projects and hard-to-fund infrastructure replacement projects
- Give an expert responsibility to design and install the work
- Install the improvements in a short period of time
- Have all work fully commissioned to your satisfaction
- Structure the deal so the project is self-funded from savings
- Have the savings guaranteed over the full term of financing

Would you be interested?

5

Consider an Energy Performance Contract

- An Energy Performance Contract or “EPC” is a tool to **reduce** energy use and expense *and* **modernize** energy infrastructure.
- Annual savings over the term of the contract pay capital costs for energy improvements, making a project **self-funding**.
- Specialized contractors called **Energy Services Companies** or ESCOs do this work.
- The ESCO helps identify advantageous sources of **up-front capital** and any **incentives** that may be applicable.

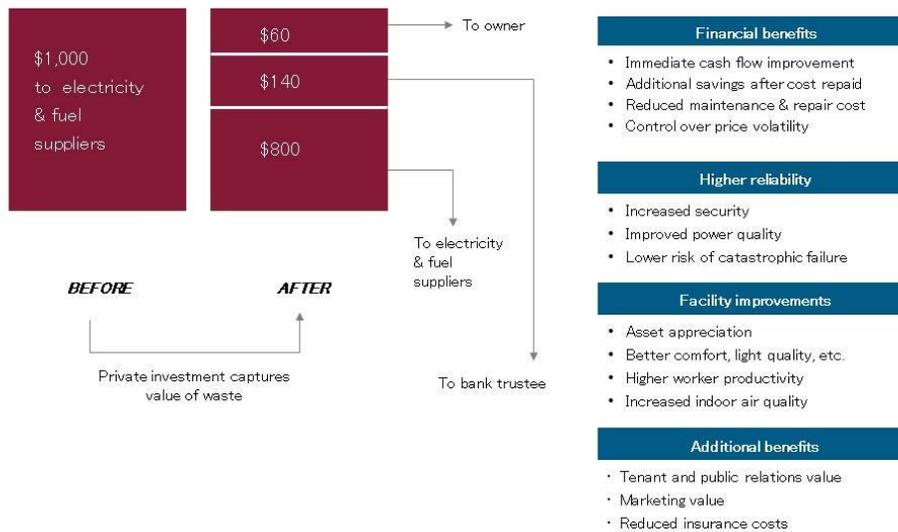
6

What else makes this approach attractive?

- EPCs permit an owner to **dictate project goals and parameters**
- They **follow a formal process** for energy audits, design, construction, commissioning, and savings verification
- **Publicly-vetted contracts** are available to adapt and use
- Contracts can provide **procurement transparency** with competitive bidding and use of favored sub-contractors
- ESCO brings both **technical and project management expertise**
- Private lenders will **finance** projects based on guarantees

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