



CLINTON
CLIMATE
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**BUILDING OWNERS & MANAGERS ASSOCIATION INTERNATIONAL
AND CLINTON CLIMATE INITIATIVE
ENERGY EFFICIENCY BUILDING RETROFIT TOOLKIT**

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INTRODUCTION

Now more than ever, energy efficiency is at the forefront of economic, energy security, and climate change agendas. Around the world, governments are focused on energy efficiency and clean energy as the keys to creating “green collar” jobs, fostering economic recovery and future development. Government is investing to jump-start the clean energy economy, and many jurisdictions are now requiring disclosure of energy consumption data in buildings and may even require owners to make investments to improve the efficiency of their buildings. Aside from these political pressures, energy prices are expected to continue to rise for the foreseeable future as fossil fuels become more expensive to find, extract, and bring to market, and utilities work to meet ambitious renewable energy mandates.

Beyond the arguments for legal compliance or risk mitigation, there are measurable financial benefits to improving energy efficiency – both for building owners and for tenants. Projects can be structured in such a way that a building’s net operating cash flow is preserved or even enhanced, while the owner gets a modernized building and tenants enjoy a more comfortable indoor environment with a lower overall cost of occupancy. The competitive advantages of high-performance Energy Star or Leadership in Energy & Environmental Design (LEED)-certified buildings have been shown in numerous studies, and research shows that tenants are increasingly focusing on sustainability and are beginning to migrate to high-performance, modern, energy efficient buildings as their leases turn over.¹

But it can be difficult in today’s crowded, fragmented energy services marketplace to determine the “best” way to cost-effectively improve energy efficiency. To address this issue, the Building Owners & Managers Association International (BOMA) and the Clinton Climate Initiative (CCI) released the BOMA/CCI Energy Performance Contracting (BEPC) Toolkit in January of 2009. The BEPC Toolkit laid out a best practice approach to undertaking holistic building efficiency

retrofits within an energy performance contracting framework, where costs and savings are financially guaranteed by the contractor. Since that time, building owners have used the BEPC template documents to facilitate the development of energy efficiency projects in more than 20 cities on 5 continents.

The BEPC documents have evolved over the course of developing these retrofit projects, and as the state-of-the-art advances, BOMA and CCI seek to update and expand the BOMA/CCI energy efficiency resources to incorporate emerging best practices. While BEPC focused on Energy Performance Contracting (EPC) as the primary project delivery mechanism, the current BOMA/CCI Energy Efficiency Toolkit applies a flexible, open source model to developing energy efficiency projects, while still maintaining CCI’s best practices in project development and implementation.

This BOMA/CCI Energy Efficiency Contracting Toolkit is designed to help building owners assemble the right combination of external resources to complement the owners’ in-house capacity and streamline the development of energy efficiency projects that are both holistic and cost-effective by fostering competition, transparency, partnership, and innovation. The BOMA/CCI Energy Efficiency Toolkit and supporting template documents were developed with support from leading practitioners within the commercial real estate industry, including building owners, investors, management companies, architects, builders, engineers, and project developers. BOMA and CCI are pleased to continue to support the progress of the real estate industry towards a more sustainable future.

THE BUILDING OWNERS & MANAGERS ASSOCIATION (BOMA) INTERNATIONAL ROLE

For more than 100 years, BOMA has supported the development of best practices within the real estate industry through research, education, and advocacy. In the spirit of this tradition, BOMA has partnered with CCI and collaborated with major real estate companies and energy efficiency service providers to develop a

model to help owners/operators execute deeper, more sophisticated energy efficiency retrofits and bring about greater operational improvements in investment real estate. BOMA's role is to be the unbiased resource and solutions provider to facilitate voluntary, business-case-driven market transformation of the built environment.

BOMA provides additional educational resources to support understanding of the key value and business drivers for increasing energy efficiency. For example:

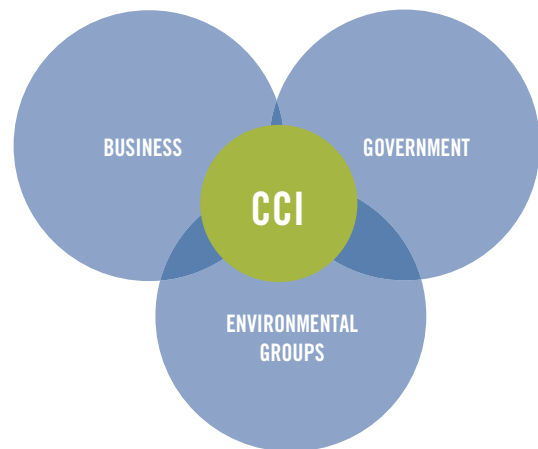
- Real estate professionals and service provider partners have access to education, information sharing, and case studies through the annual BOMA International Conference and Every Building Show.
- The Sustainable Operations Series (SOS) program is a series of four webinars that teach practical ways to "green" a building's operations. Topics covered include:
 - Understanding and evaluating opportunities for implementing green strategies, including various certification options
 - Identifying "best bets" for greening buildings without major capital expenditures
 - Evaluating the ROI on green operations and equipment
 - Working effectively with owners and tenants to implement sustainable practices, protocols, and even technologies
- BOMA Energy Efficiency Program (BEEP) is a six-course curriculum taking owners and operators through every aspect of energy efficiency. BEEP course 5, "The Financial Valuing of Energy Efficiency," covers performance contracting in general and the BEPC specifically.

CLINTON CLIMATE INITIATIVE (CCI) ROLE

CCI MISSION STATEMENT

To make a difference in the fight against climate change in practical, measurable and significant ways.

Consistent with this mission, CCI's Energy Efficiency Building Retrofit Program (EEBRP) endeavors to expand the global market for building energy efficiency. Partnering with owners to develop projects, CCI works with expert practitioners to develop best practice contracting methodologies; with technology suppliers to bring down project development costs; and with providers of capital to develop innovative project financing mechanisms.



CCI EEBRP staff provides pro bono assistance to building owner partners in the development and execution of large-scale energy efficiency building retrofits, including:

PROJECT DEVELOPMENT ASSISTANCE

CCI will offer assistance to its partners during the project development process in order to design and implement a best practice energy efficiency project. These services include:

- Assisting in the definition of financial, environmental, and other project goals
- Assisting in the development of a work plan and project schedule

- Providing support in incorporation of best practices into project design and development
- Non-legal assistance in adapting contracting tools and templates for partner use
- Technical assistance in review of contractor/supplier materials and proposals
- Monitoring of contractor/supplier performance and commitment to CCI agreements
- Serving as a neutral advisor as needed through the project development process

KNOWLEDGE AND UNDERSTANDING OF BEST PRACTICES IN CONTRACTING

CCI works with building owner partners to determine the most effective mechanisms to achieve the owner's desired results and has developed best practice approaches in energy efficiency retrofitting, retro-commissioning, and procurement of energy efficient building technologies that have been implemented in projects around the world.

ACCESS TO THE BENEFITS OF CCI'S INDUSTRY AND INSTITUTIONAL PARTNERSHIPS

- CCI will make available to its partners pre-negotiated best-practice contracting terms and conditions, product discounts, and streamlined acquisition terms with suppliers of energy efficient products and related services.
- CCI will assist in convening appropriate contractors to carry out the work and monitor contractors' performance and commitment to CCI agreements.
- In addition, CCI has relationships with leading organizations influencing the built environment including real estate associations, green building experts, and other nonprofits and environmental groups. CCI works with these partners to leverage their collective expertise and resources to share best practices from around the world.

PROJECT FINANCE ADVISORY SUPPORT

While CCI does not provide direct financial support to projects, CCI helps owners identify mechanisms

and financial providers to bring capital to energy efficiency projects.

At the project level, CCI can assist partners with financial modelling, assessing the appropriate finance structure, soliciting interest from capital providers, reviewing proposals/term sheets, and assisting, where appropriate, in the negotiation process.

At the programmatic level, CCI can assist institutions (public and private) in developing sustainable, scalable, and market-driven solutions for financing retrofits across entire building market segments (e.g. commercial office, institutional, multi-family residential). To this end, CCI typically assists in convening stakeholders, assessing market demand from building owners and financial institutions, identifying legal and accounting related issues, and developing and executing on a work plan.

RECOGNITION

CCI works confidentially with its partners, but as part of its global reach and mission, CCI seeks to spur progress by sharing the achievements of partners that implement energy efficiency building retrofits and achieve measurable results in reducing greenhouse gas emissions. CCI works with partners to create opportunities to celebrate successes.

BUILDING OWNER ROLE

CCI seeks building owner partners that are committed to reducing energy use across their building portfolios through the implementation of bottom-line driven projects that achieve the maximum environmental benefit. To this end, CCI asks its partners for the following commitments:

COMPLETE "PRE-QUALIFICATION" STEPS

To increase the chances of project implementation, CCI asks owners to complete certain pre-qualifying steps:

- Define specific project goals and financial criteria for the project
- Develop a work plan, timeline, and project milestones

- Identify buildings under ownership or control for inclusion in project
- Understand ownership and lease structure and the ramifications for a retrofit project
- Understand potential sources of capital for the retrofit project
- Compile building/portfolio data (see Attachment 1 to the Sample RFQ/P for a sample Property Information Summary) including, at a minimum:
 - Each building’s annual energy consumption, utility spend, and copies of twelve months of energy bills
 - Building age, type, size, equipment inventory, systems information, and dates of any past/ planned upgrades

OBTAIN APPROPRIATE INTERNAL APPROVAL TO DEVELOP AND IMPLEMENT A BUILDING RETROFIT PROJECT

- Secure necessary internal approvals to enable timely decision-making around project development and implementation
- Obtain appropriate commitment and participation from key internal decision-makers in facilities, procurement, legal, and finance, including budgeting of funds to finance the retrofit projects if necessary

ENSURE APPROPRIATE INTERNAL RESOURCES ARE AVAILABLE TO COORDINATE AND SUPPORT THE PROJECT

- Designate an internal project manager to oversee the energy efficiency project and to serve as a primary point of contact throughout the process
- Prepare to hire external technical/financial assistance as needed
- Assemble an internal project team which should include key building operations staff as well as financial, legal, procurement, and other appropriate internal stake-holders such as tenants
- Secure “delegated responsibility” for this team to make decisions relating to the selection of the preferred bidder, approval of the final list of buildings selected through the portfolio analysis, and approval of investment grade proposals in order to meet the project schedule

WORK WITH CCI TO CREATE A CASE STUDY AND RECORD OF PROJECT SUCCESS

- Share the results and successes of the project with CCI, including providing ongoing reporting of results for confidential GHG reduction tracking and information for case studies

BEST PRACTICES IN ENERGY EFFICIENCY CONTRACTING

CCI supports underlying best practices in energy efficiency project development that help to set a project up for success. These best practices are universal and independent of contracting methodology, and they promote transparency, protect building owners’ financial and operational interests, and encourage an atmosphere of open partnership and shared mission between the building owner and the team assembled to implement the project.

Building owners should understand and consider these best practices early in the project development process. CCI helps owners locate implementation partners committed to the best practices and can stay involved in the project(s) to ensure that best practices are followed.

Best Practice	Benefit to Owner
<p>Whole-building Approach Utilize a whole-building approach— all potential opportunities should be considered and scope refined to meet owner’s project requirements from this comprehensive scope.</p>	<p>Every building offers unique opportunities. Rather than limit the scope by prescribing a list of retrofit measures, owners should encourage the project team to exhaust all possibilities and put forth the most holistic project possible. Project teams should have the ability and willingness to consider a broad spectrum of energy conservation measures.</p>
<p>Start with Clear Goals Owner defines clear environmental and financial goals and any other metrics of success.</p>	<p>At the pre-project stage, financial goals should be kept as broad as possible to allow the project team room for creativity. After the initial opportunity assessment and prior to beginning the investment grade audit (IGA) phase (the basis for the design phase), concrete project-specific financial and performance requirements should be communicated to the project team to aid in decision-making as energy conservation measures (ECMs) are considered. Casting a wide net initially and narrowing down the final scope based on clear performance metrics leads to the most optimal balance of innovation and cost-effectiveness.</p>
<p>Transparent Consumption Baseline Developed in collaboration with building staff.</p>	<p>It is impossible to calculate savings accurately or confidently without a clear baseline. This baseline must be understood and agreed upon by both the owner and the project team in order to facilitate project scoping and avoid possible future disputes over savings calculations.</p>
<p>Lifecycle Cost Analysis & Business Risk Assessment Consider operational and maintenance savings, synergies between Energy Conservation Measures, greenhouse gas (GHG) reductions, and risk mitigation when evaluating cost effectiveness.</p>	<p>Operations and maintenance (O&M) savings can be significant, and certain ECMs, when implemented in combination, achieve savings greater than the sum of their parts. While sometimes difficult to calculate, these factors are real and should not be overlooked. The impact of changing regulations, such as carbon taxes and/or cap and trade and the GHG emissions reductions that they will require should factor in to project scoping decisions. Project teams should be able and willing to provide this project analysis and the owner should incorporate it into their business case. Owners should then factor in how the proposed retrofit affects the asset's overall risk profile, considering: utility rate risk, regulatory exposure, systems reliability and up-time, re-tenanting risk, exit cap rate.</p>
<p>Thorough Commissioning Of all new equipment/systems and retro-commissioning of all affected systems and sub-systems.</p>	<p>Too often new equipment is not properly commissioned, leading to sub-optimal design performance and savings shortfalls. In order to realize the full efficiency gain from the new equipment, all building systems should be retro-commissioned to ensure that new and existing systems are working together efficiently.</p>
<p>Transparent Pricing For all services and materials, whether self-performed or sub-contracted.</p>	<p>Project teams should be able and willing to provide full transparency in pricing of materials, equipment, soft costs and labor, including all contractor margins, overhead and profit, labor burden, corporate burden, fees, as well as any costs for insurance and bonding. Contractors should identify any pieces of work that will be self-performed, and demonstrate that pricing is competitive either by seeking multiple bids or through another means acceptable to the owner.</p>
<p>Robust Measurement and Verification (M&V), Monitoring-based Commissioning Ongoing M&V in accordance with international best practices, the IPMVP. Ongoing monitoring-based commissioning should also be considered.</p>	<p>The owner should fund and plan for robust ongoing measurements of project performance and ongoing commissioning. This is essential in order to preserve the savings stream and prevent erosion of savings over time. This information can be shared with tenants and other stakeholders to celebrate successes and encourage further improvement. Owners should consider hiring an external provider if these resources and skills are not available internally.</p>

<p>Vendor Neutrality and Open Protocol With regard to recommendations for specific technologies/services.</p>	<p>The project team should evaluate any equipment recommended for upgrade/replacement without bias towards a specific manufacturer so that the owner can be confident that the most appropriate and most cost-competitive technologies are selected. Any controls or software overlays installed should ideally be open source so that the owner will have service/maintenance flexibility.</p>
<p>Firm Investment Proposal So that the owner can accurately budget and efficiently source capital.</p>	<p>By the end of design development, the owner should have a firm investment proposal for the final scope, including a maximum price and minimum savings so that a clear and complete investment analysis can be undertaken.</p>
<p>Project Team "Performance Assurance" The project team should have the ability and willingness to provide certainty that the work installed will perform as expected.</p>	<p>The project team should provide some form of performance assurance. This can be accomplished through bonding, energy savings insurance, or more traditional performance guarantees.</p>

A GUIDE FOR BUILDING OWNERS: GETTING STARTED

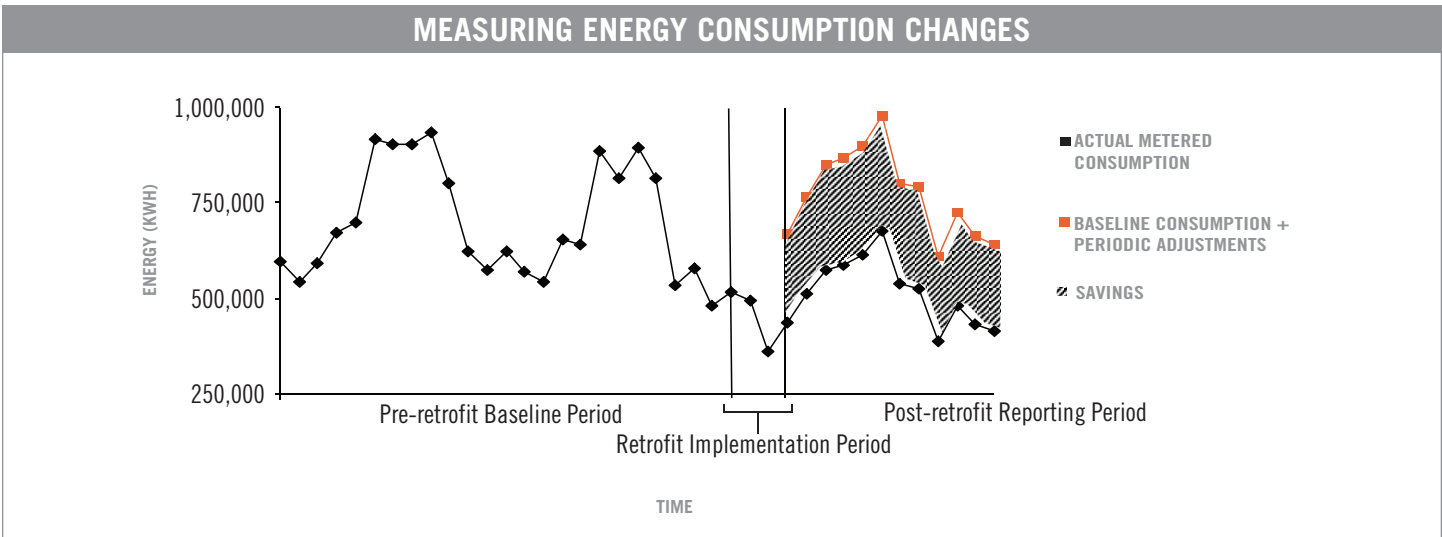
It is important for building owners to understand a few key ideas and pieces of terminology before undertaking an energy efficiency project.

UNDERSTANDING THE CONSUMPTION BASELINE

Unless a more sophisticated energy model is employed, a building’s consumption baseline is generally developed by running a multiple regression analysis² over a set of data pulled from a building’s Building Management System and past utility bills. This analysis predicts a building’s energy consumption as a function of certain key variables such as occupancy, hours of operation, building use, and weather data. By back-casting over

the historical data and eliminating variables with low predictive value, the model is refined until it predicts the building’s historical energy consumption with a high degree of accuracy, at which point it can be asserted that the model can also be used to predict future energy consumption. Said another way, all other variables being equal, the consumption baseline equation can be used to predict how much energy the building would have used in a given time period had there been no efficiency upgrades made.

Figure 1: Savings are calculated by comparing post-retrofit consumption to baseline (“business as usual”) consumption.



Source: www.EVO-world.org

These baseline numbers are included in contracts and serve as the basis for assessing the future success (or failure) of project performance. The process of developing the consumption baseline equation should be made transparent to the owner, so that both the contractor and the owner are comfortable that it accurately predicts the building's pre-retrofit energy consumption. The baseline equation is made explicit in any Energy Performance Contract, but no matter what the contractual structure, it is critical for all parties to agree that the baseline is valid, since savings and performance will be calculated relative to its predictions.

It is important to note that the consumption baseline is not fixed because key variables used to predict a building's energy consumption (such as occupancy and heating degree days) vary from year to year. For example, if one year is particularly hot or cold and there are more heating/cooling degree days than in the base year, the consumption baseline would have to be adjusted upwards to reflect that – meaning that absolute “savings” will be lower than in the base year. The International Performance Measurement and Verification Protocol (IPMVP), which is discussed below, further explains the need to adjust raw differences in energy use for changes in conditions between baseline and savings reporting periods.

SAVINGS ARE CALCULATED – NOT “MEASURED”

*ADJUSTED BASELINE
CONSUMPTION*

— *MEASURED POST-RETROFIT
CONSUMPTION*

“SAVINGS”

“Measurement of savings” is a somewhat misleading phrase in that savings cannot be directly measured, since by definition savings are the absence of consumption. What can be measured is post-retrofit consumption, and savings can then be calculated by comparing measured post-retrofit consumption to a pre-retrofit consumption baseline. While the existence of some level of energy savings may not be in dispute, savings cash flows are difficult to isolate and track without a clear baseline and adequate measurement and verification (M&V) infrastructure. It is critically important for all parties to agree on the appropriateness and accuracy of post-retrofit consumption measurement and on the baseline against which it is compared. Without this agreement, it is impossible to calculate savings accurately, which can lead to significant disputes down the road with lenders, tenants, and/or members of the project team itself.

MEASUREMENT & VERIFICATION (M&V) IS CRUCIAL

The wisdom of Jack Welch's motto “you can only manage what you measure” is widely recognized, yet too often the performance of energy efficiency projects is not measured diligently or accurately, and predictably, savings erode over time. In this toolkit, the term measurement and verification (M&V) refers to the creation of a specific program, designed as part of a retrofit project in accordance with the International Performance Measurement & Verification Protocol (IPMVP) best practice methodology.³

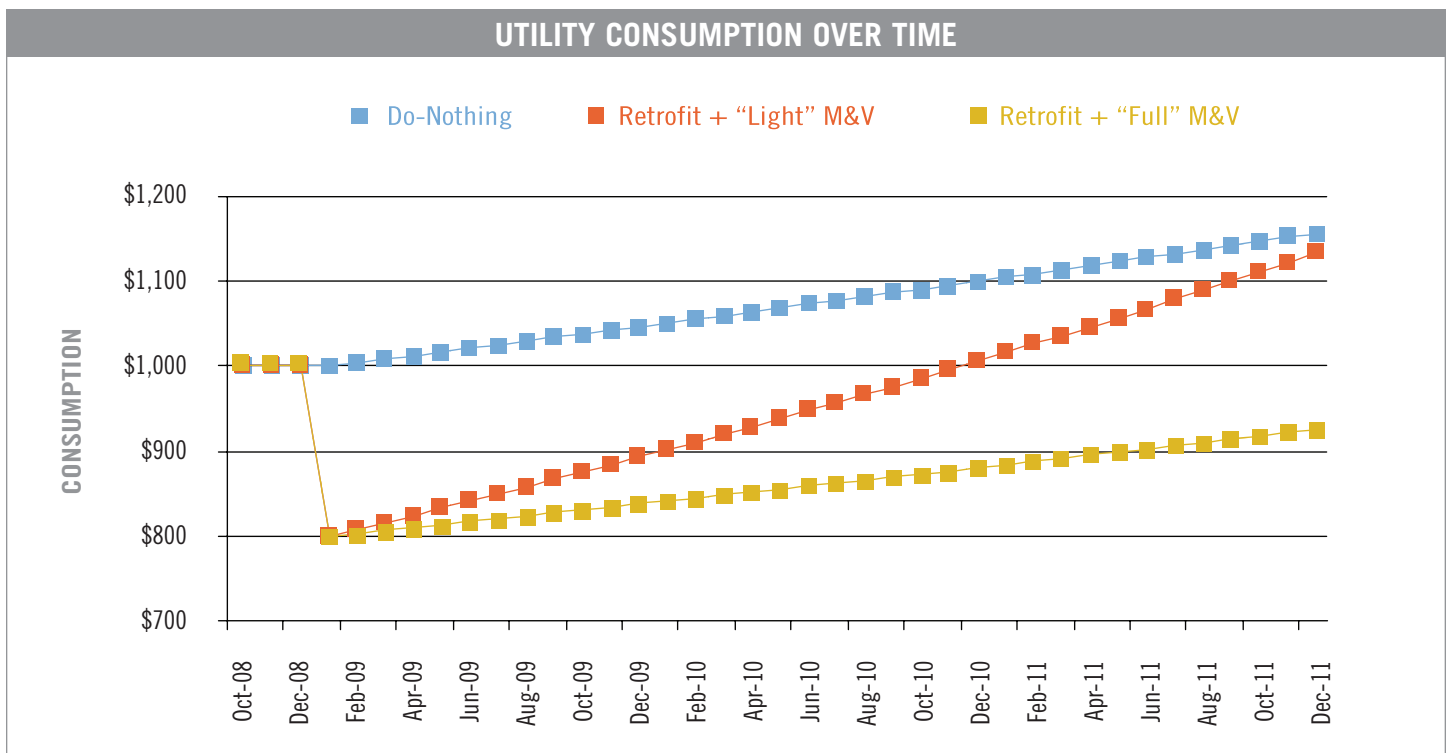


Figure 2: Without proper M&V, savings tend to “drift” over time⁴ and consumption creeps back to pre-retrofit levels. Note: this graph assumes only a 1 percent monthly degradation in savings.

Nothing is more critical to the ongoing energy performance of a building than performing diligent M&V of savings and continuous commissioning (also referred to as monitoring-based commissioning). The accuracy and granularity of data produced determines how accurately the owner can monitor and calculate energy savings. A strong M&V and continuous commissioning plan will automatically identify irregularities and underperformance so that the owner can take immediate corrective action to ensure that the building continues to operate at maximum efficiency.

Tracking performance through robust M&V practices also helps owners engage with tenants more effectively, allowing capital costs to be passed through in a fair and transparent way, and helping to communicate progress and achievements. Taken one step further, sub-metering of tenant space allows tenants to see how much energy they’re actually using, which has been shown to induce many tenants to take voluntary actions to reduce their energy consumption.

SET GOALS TO GUIDE THE PROCESS

Before embarking on an energy efficiency project, the owner should determine the project’s goals and metrics for success with as much specificity as possible. The owner should communicate these goals to the project team early in the process, and encourage the team to take a holistic look at the opportunities the building(s) presents to reach those goals. The owner’s goals and financial criteria will ultimately determine the final project scope and guide the project team in each phase of analysis.

Examples of criteria that the owner should define might include:

- Percent energy and/or water consumption to be reduced
- Percent carbon footprint to be reduced
- Hurdle rate (minimum internal rate of return or IRR)
- Required ROI
- Method of analysis: simple payback vs. life cycle costing

- Other cash flow or operating expense reduction requirements
- Desired performance certifications such as Energy Star, LEED, Green Globes
- Additional outcomes of the retrofit, such as tenant engagement, aesthetic improvements, asset renewal, or life safety enhancements

OWNER COMMITMENT AND RISK SHARING

Developing a successful energy efficiency retrofit project requires a partnership between the owner and the project team with commitment on both sides. There can sometimes be tension between contractors and owners when contractors are not confident that the owner is serious about proceeding with a project; or conversely, when the owner suspects that contractors are not transparently calculating costs or savings. Both sides' expectations of deliverables and risk sharing must be clearly laid out and agreed upon upfront. If handled in this way, both sides can move forward with confidence that a real project will materialize.

Top-flight energy efficiency professionals prioritize opportunities that are most likely to be implemented. In order to attract the interest of the best firms when issuing a request for proposals (RFP), owners should signal their commitment by communicating financial and performance goals to the respondents and by taking the initiative to gather the relevant information that the respondents need in order to evaluate the feasibility of meeting those goals. It can be costly for a contractor to pursue a given project, so in the context of a competitive RFP the more the owner can do to facilitate the initial opportunity assessment, the better the quality of the responses will be.

ALIGN INCENTIVES AND ENCOURAGE INNOVATION

One of the main objectives of the contracting approach laid out in this Toolkit is to enable owners to evaluate opportunities before investing capital in a project and to shift the risk associated with project feasibility, design, development, and performance to the project team.

However, project teams tend to be conservative in their recommendations when developing a project “at risk” (discussed below), especially if there is a performance guarantee involved.

Driving deeper energy savings requires more engineering work and greater creativity, which means more risk for the design team. In order to incentivize project teams to be creative and innovative in their approach, the owner should consider offering a bonus for exceeding initial performance goals while fulfilling investment criteria. For example, if the owner is targeting a 15 percent internal rate of return and a 20 percent energy consumption reduction, the project team could receive a bonus for delivering a project that achieves the 15 percent IRR but reduces energy consumption by 50 percent. This concept is discussed further below in the Project Development section.

ADDRESS FINANCING STRATEGIES

The owner should begin to evaluate potential financing options early in the project planning stage in order to ensure that a project can actually be funded and implemented. See the “Financing” section for further discussion of various methods to fund energy efficiency retrofits.

As part of the initial planning stage, the owner should consider the following questions:

- Will the owner self-fund the project from existing funding sources?
- Will the owner seek third-party financing?
- Will the owner ask the project team to provide financing options as part of the scope of services?

THE ENERGY EFFICIENCY VALUE CHAIN - PROJECT DELIVERY METHODS

The energy efficiency market is crowded with a huge variety of service and technology suppliers, each with different business models and areas of expertise. Understanding the energy efficiency value chain helps to determine what type(s) of firm(s) can together or

individually provide the scope of services required to complement the owner's internal resources and achieve project goals.

Energy efficiency retrofit project teams can be structured in different ways, depending on the owner's contracting preferences, staff resources, goals, and the scope of the project at hand. However a project team is organized, it should work in accordance with the best practices laid out on page 5, and the owner should make this expectation clear from the outset. Every project team should have the relevant key areas of expertise represented, including project management, engineering/design expertise, commissioning, and M&V, as well as appropriate internal checks-and-balances to promote transparency, competitiveness, and cost effectiveness.

CCI recommends that building owners work with a project developer to provide a single point of contact and perform/coordinate the various services necessary to implement the project. A project developer might be an Energy Services Company (ESCO), a general contractor/builder, a real estate developer, or another qualified firm.

Working with a project developer streamlines the contracting processes and provides a single point of accountability and maximum risk sharing. Transparency in pricing, product selection, audit results, and baseline/M&V calculations must be diligently enforced by the owner when working with a single project developer, and owners might elect to bring on an owner's representative to provide additional oversight and assistance with auditing contractor bids, pricing, engineering design, or post-retrofit savings calculations.

A traditional Design-Bid-Build structure can encourage pricing transparency and drive down costs through competitive bidding, but tends to decrease risk sharing, creativity and collaboration between team members. It can be less difficult to assign accountability for cost overruns in a Design-Bid-Build scenario, but the risk related to energy performance generally falls to the

owner since the various firms involved generally will not accept liability for each others' work. Involving a project developer shifts project risk away from the building owner, and so long as transparency is provided, significantly streamlines the project development process and reduces the cost of waiting.

The project development process described in this guide is an "Integrated Design Approach," in which the entire project team is brought into the project early in the process, with a lead firm or project developer taking on project design and performance risk. A good project developer can take on the design and construction risk of the project and balance innovation with efforts to control costs. The project developer is responsible for assembling the project team, which works as a single unit for the purposes of responding to RFPs and contracting with the building owner. In this approach, the various project team member-firms work collaboratively from the very beginning of the project development process to explore the unique opportunities that each project provides. This collaborative methodology is not yet the norm for all firms, so owners should be clear about their expectations and incentivize such collaboration wherever possible.

PROJECT ROLES AND TEAM STRUCTURE

The principal of integrated design requires interaction between the many participants in the retrofit project.

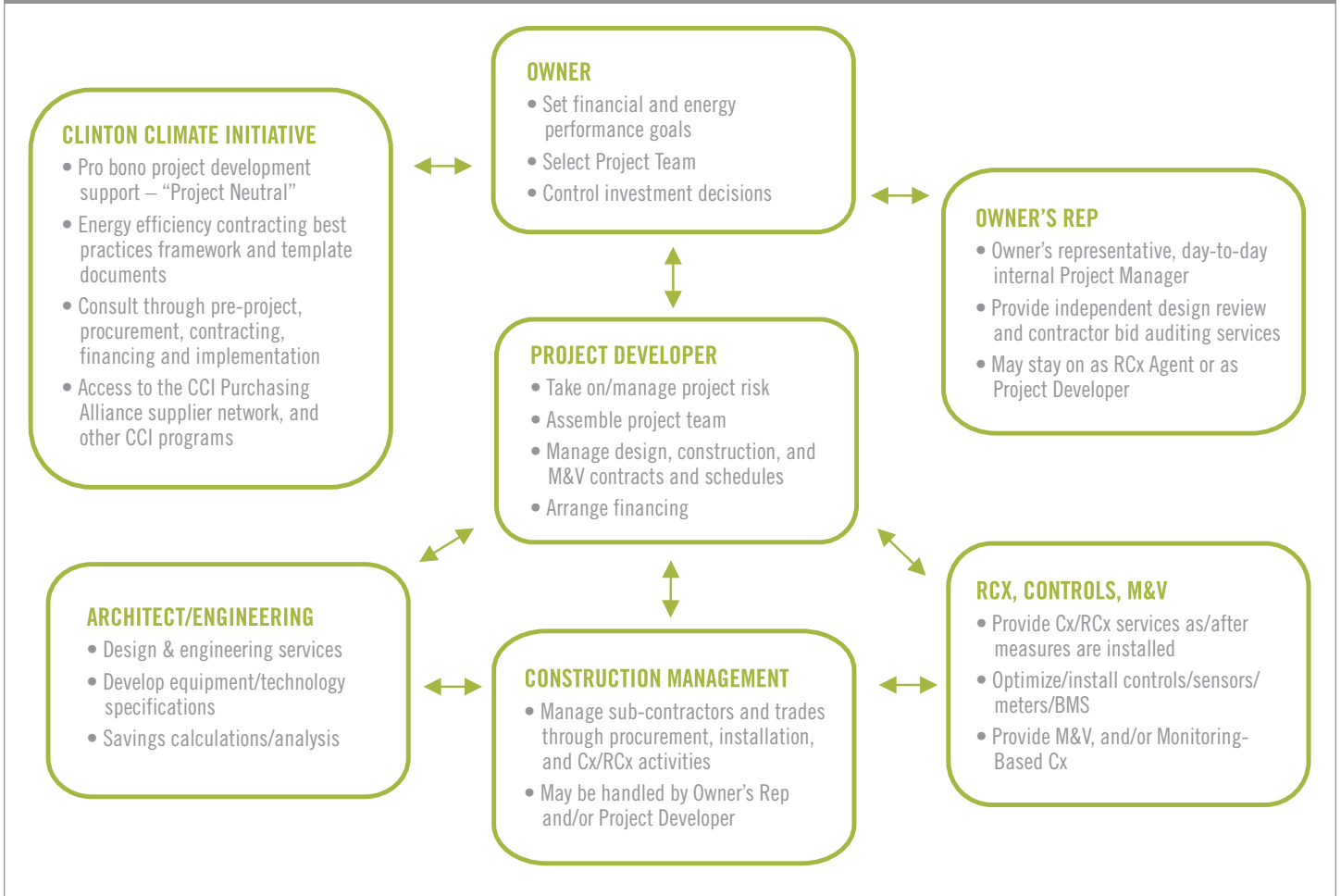
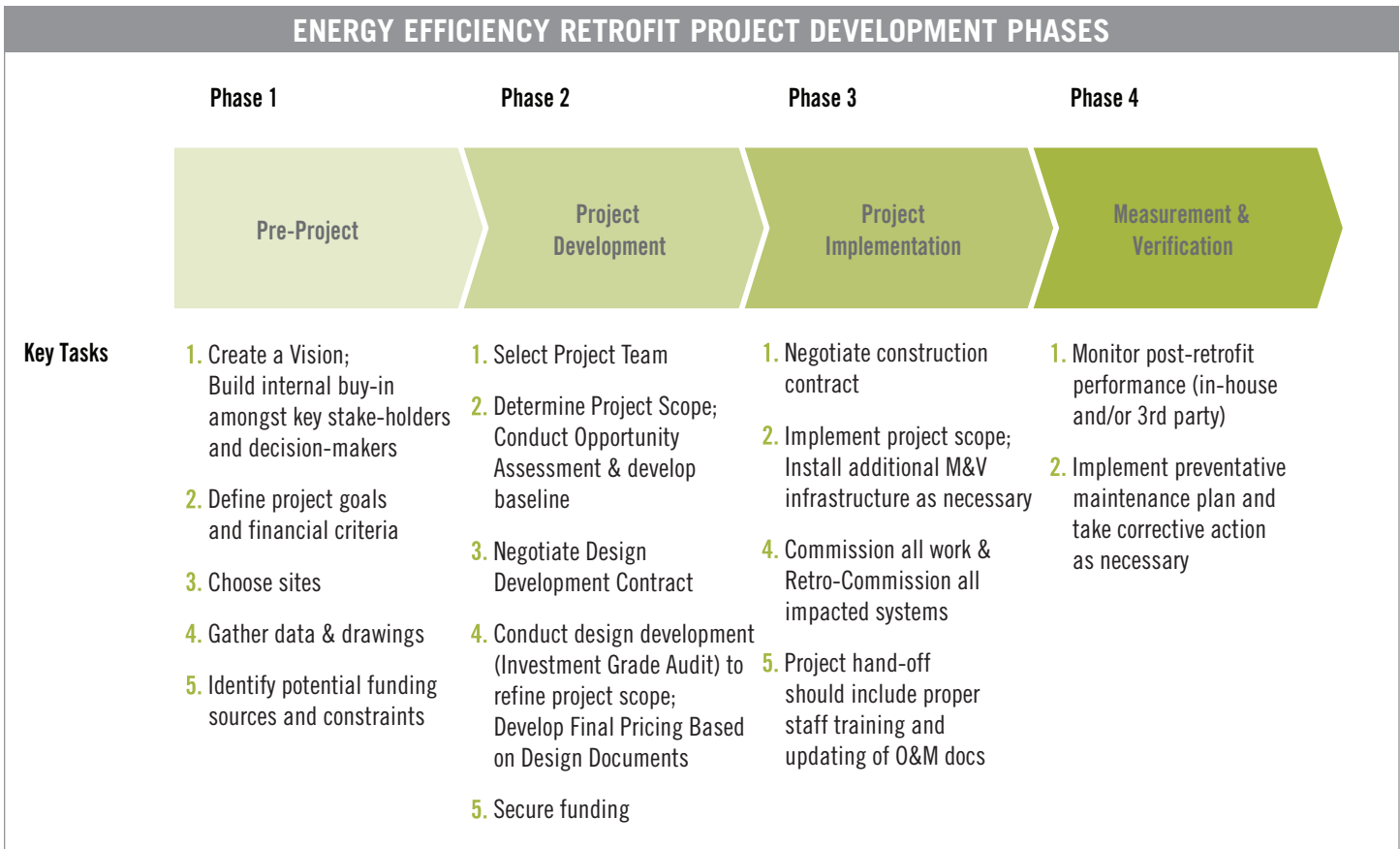


Figure 3: The principal of integrated design is being used to guide innovative solutions in new construction projects – retrofit projects are no different.

THE PROJECT DEVELOPMENT PROCESS

Figure 4: Building retrofit projects can seem daunting and complex, but no matter what contracting methodology is used, project development can be broken down into four phases.



PHASE 1 – PRE-PROJECT

CREATE A VISION, BUILD INTERNAL BUY-IN

CCI has found that a critical first step for planning and executing successful energy efficiency and sustainability programs is creating an overarching vision for what the company seeks to accomplish, and why. This helps to prioritize potential projects in a strategic fashion, build internal support for the effort, and to get each project through the planning process and into implementation.

As a first step, the owner should consider the following fundamental questions:

What do we want to accomplish, by when?

- Percentage greenhouse gas (GHG) emissions reduction in 1, 3, 5, 10, 25 years?

- Percentage energy and water savings?
- Percentage energy from renewable sources?

Why is this important?

- Industry leadership?
- Delivering long-term value to investors?
- Commitment to tenant/staff wellbeing?
- Differentiation/3rd party certification?

Who is the audience?

- Internal and/or external goals?
- Who wants to know what? How can we communicate what we're doing?

DEFINE PROJECT GOALS AND INVESTMENT CRITERIA

Once the owner has clearly stated an overarching vision, the next critical step is to decide on financial criteria by which to evaluate potential projects. Having clear investment criteria makes conversations with external service providers and internal financial decision-makers go much more smoothly, since all parties are clear on what constitutes a “successful” proposal.

The owner should set aggressive but attainable initial goals for financial performance and work with the project team to scope, design, and deliver the most holistic possible project that meets these criteria (as discussed above). While it is obviously helpful to identify any specific known project opportunities (for example that the building needs a new chiller), the project goals should not be a “list of interventions,” but rather focus on financial and environmental outcomes so that the project team can be as creative as possible in achieving the owner’s desired goals.

EXAMPLE OF PROJECT GOALS

Energy Conservation Measures must be projected and/or guaranteed to:

- Achieve a minimum 10 percent unlevered IRR
- Be cash-flow positive in year two, factoring in all rebates, energy, and operational savings
- Produce energy and operational savings sufficient to cover or exceed any debt service payments
- Yield a blended simple payback of 10 years or less across the entire project
- Measures that do not meet these criteria will be considered if the equipment is at the end of its useful life.

For example, if the primary goal is to reduce operating costs by a certain percentage, buildings that have greater than average operating costs and utility rates would be the first target; whereas if reducing the carbon footprint is the goal, buildings that are located in markets with a high-carbon energy mix should be chosen.

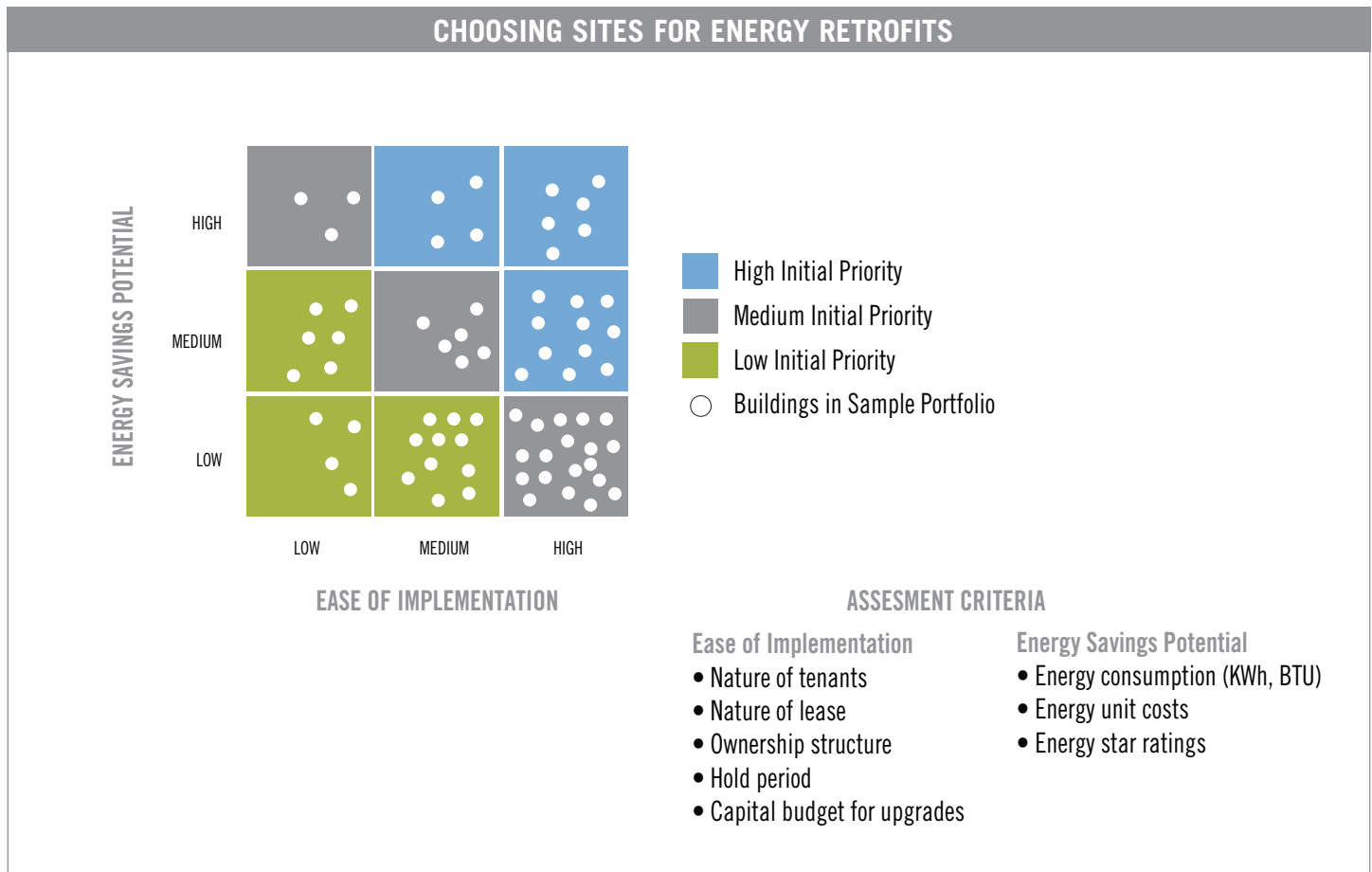
There are a number of factors for an owner to consider when selecting project sites, but in general, buildings with the following characteristics provide the greatest opportunities:

- Higher than normal energy use index
- Located in markets with relatively high energy prices
- Equipment/systems are outdated or near the end of their useful life
- Fewer tenants, and/or lease structures that allow for the pass through of capital upgrade costs⁶
- Owned by/with investor(s) that are supportive of investments in energy efficiency
- Available capital reserves to leverage for the project
- Stable occupancy with consistent energy-use patterns over several years

PRIORITIZE AND CHOOSE SITES

The selection of sites should not be random but should deliberately match the owner’s overarching project goals and the opportunities that the portfolio offers.

Figure 5: Within a portfolio, it is critical to understand which buildings represent the greatest opportunity for energy savings and which pose the fewest challenges to implementation.



Combining several facilities into a single project offering can make economic sense. Although the projects need not be executed simultaneously, multiple-building projects are more attractive to both contractors and lenders and allow the owner to realize scale economies and negotiate improved financing terms through a single procurement.

GATHER DATA AND DRAWINGS

Project development can get bogged down if the relevant data and drawings are not readily available. Contractors are not able to give meaningful proposals without adequate information about the building, so at a minimum, the owner should compile the information detailed in Attachment 1 to the sample RFQ/P, the “Property Information Summary,” for each building to be included in the project. Providing this level of data also signals that the owner is committed to putting

in the effort required to develop a successful project, which increases the chances that the most qualified firms will respond to the solicitation.

IDENTIFY FUNDING SOURCES

As will be discussed below, the owner has no money at risk unless the project team is able to develop a project that meets the owner’s financial criteria and the owner proceeds to implement the project. However, as discussed above, in order to attract interest from service providers it is important to have identified funding sources to at least cover the costs of design development, should the project meet the financial criteria but not ultimately move forward for whatever reason. If the owner’s ability to implement is contingent upon securing financing, the project team will still expect to be compensated for its work.

PHASE 2 – PROJECT DEVELOPMENT

SELECT PROJECT TEAM

The RFQ/RFP process of selecting a building retrofit project team is akin to assembling a team for a ground-up development project. A similar spectrum of skill sets, resources, and capabilities is required, including: project management, design, engineering, construction management, commissioning, and M&V. Team structures may vary depending on the owner's needs and the members' various business models, chosen roles, and capabilities – but each should represent the range of skills and capabilities necessary to carry out a best practice energy efficiency project.

The RFQ/P should contain all of the information a respondent needs in order to assemble the rest of the project team and prepare for the selection process such as:

- Project goals and investment criteria
- Site information (property information summary)
- Procurement process and timeline
- The desired overall project team composition, skills and structure
- Expected response content and format
- Evaluation process and criteria
- Project development process and expected timeline

Depending on their business models, the RFQ/P respondents may be able to perform only some of the services, but are expected to leverage their professional networks to round out the project team with the requisite skill-sets for the project at hand in response to the RFQ/P.

The response to the RFQ/P will include a preliminary project scope to provide the owner with a rough order of magnitude as to the savings opportunities in the building(s) and will give the owner a sense of the respondents' different approaches and unique capabilities.

EXAMPLE PROPOSAL SOLICITATION

An owner issues an RFQ/P to 3 different “project developers,” each of whom offer turn-key energy efficiency project development services working in accordance with CCI Best Practices for energy efficiency contracting

- Construction management company (CM) – The CM proposes to act as the “prime” contractor and CM, managing a pre-selected team of engineers and sub-contractors, but offering to bid all work as a team
- Energy services company (ESCO)/design-build contractor – The design-build contractor proposes on its own, but commits to transparency in pricing and bidding of work, whether sub-contracted or self-performed
- Developer – The developer proposes to act as the single point of contact, working with the owner's preferred contractors/vendors, managing the transparent bidding of all work and sourcing financing for the project

The owner evaluates these different proposals to see which structure best suits their needs and business practices and makes a selection.

Based on this information, the owner can safely select a project team to proceed to a more detailed analysis of the building(s) before a contract is signed. If the process described in this guide is followed, the owner has no money at risk until or unless the selected project team makes a firm investment proposal for a project that meets the owner's predefined investment criteria. Please see the sample RFQ/P and additional tools for evaluating proposals provided in the Library of Documents for additional information.

If the owner chooses to proceed under an energy services performance contracting model with an ESCO as the contractor, BOMA and CCI suggest using the procurement process and model contracts provided in the BEPC toolkit. These tools were developed by BOMA and CCI in association with owners, managers and several top-tier ESCOs to incorporate best practices in energy performance contracting, and are available for free download online at: <http://www.boma.org/RESOURCES/BEPC/Pages/default.aspx>

DETERMINE PROJECT SCOPE

Once a project team has been selected, it will proceed to analyze the building facility more deeply to further develop the preliminary scope of work and hone the initial estimates of projected costs and savings included with the RFP response. This Toolkit refers to this stage as the preliminary assessment (PA). Under the BOMA/CCI contracting framework, there is no binding contract signed until the owner and project team are sufficiently confident that the owner's financial criteria are achievable. However, at this PA stage a non-binding letter of intent between the owner and the chosen project team helps to indicate both parties' commitment to proceed to design development should the preliminary analysis prove promising. To develop the PA report, the project team must conduct at least one site visit and have access to plans, drawings, utility bills, and key building staff.

All analyses conducted in developing the PA report should be shared with the owner prior to execution of the design development contract so that both parties have a clear understanding of the potential project scope and the expected financial "metrics for success." It is important that the project team involve the owner in the base-lining process, ensuring that the owner understands how the baseline is adjusted and how savings are calculated.

To facilitate the owner's analysis of the PA report, the project team should provide cost and savings information for each proposed measure in a clear format with any assumptions clearly stated. Please see the Additional Resources Section for a template "ECM Screening Tool." Bearing in mind that the savings and costs estimated in the PA report will be further refined in the IGA phase, owners should evaluate the preliminary proposal against internal financial criteria to begin refining the project scope in collaboration with the project team.

NEGOTIATE DESIGN DEVELOPMENT CONTRACT

Throughout the RFQ/P and PA processes, the owner assumes no cost or risk. However, since significant engineering and design work is required to develop a firm investment proposal and scope of work, the project team will require that a binding contract be put in place before beginning the design phase. This design development contract commits the owner to proceeding with the project so long as the project team is able to deliver a firm investment proposal that meets the financial "metrics for success" that both sides agreed to, based upon the results of the PA report.

Under the BOMA/CCI approach, if the project team is unable to develop a project that meets the owner's stipulated investment criteria, there is no charge for the design work.⁷ However, the design development contract includes a "walk-away fee" to cover the project team's engineering and design costs should the owner elect not to proceed with a project that does in fact meet the investment criteria.⁸ To avoid this walk-away scenario, before executing the design development contract the owner should ensure that funding will be available to implement the project should it meet the investment criteria. If the proposed project meets the owner's investment criteria and the owner moves forward, the cost of the design work is rolled into the overall project cost.

When following the integrated design approach – where there are multiple firms working in the building simultaneously – individual firms may not necessarily be comfortable working “at risk” in the design phase. This point should be addressed upfront in the initial RFQ/P by prompting the respondents to develop the necessary comfort level with each other’s work before responding to the RFQ/P together as a “project team.”

Many of the best practices in energy efficiency contracting come into play in the design development phase and therefore should be included in the contract. BOMA/CCI have developed a template design development contract provided in the Additional Resources section as a starting point for negotiations. Whatever agreement is used, the owner should understand, define, and explicitly request the following key elements in a design development contract:

Owner-defined Investment Criteria

- Based on the initial PA report, the owner and the project team agree on attainable financial returns and energy savings outcomes before signing the contract to begin the design development phase. These success metrics can be expressed in different ways, such as simple payback, ROI, IRR or hurdle rate, operating cost savings (total or per square foot).
- Goals can also be expressed in non-financial terms such as percent reduction in energy use, desired energy or environmental certification, or GHG emissions. The owner can define multiple criteria, but they should be feasible to attain together. For example, a 20 percent energy reduction with a two-year simple payback may not be possible.
- The definition of success, how it will be measured, and how the project team should demonstrate success (what specific deliverables will be provided) should all be stated in the contract.

Site Constraints

The owner should communicate any site constraints or restrictions that may affect the design and construction schedules, such as occupancy patterns, any access

restrictions, and other local issues (such as permitting) that will affect the price and timeline of the project.

Deliverables

- **Transparent Baseline Consumption Analysis:** Full analysis and definition of baseline consumption for each fuel and utility type. Again, this baseline should be developed in consultation with the owner to ensure both sides agree that it accurately reflects the building’s pre-retrofit performance.
- **“Biddable” Design Documents:** The contract should clearly state that, at the end of the design development phase, the project proposal should be complete enough to accurately develop a guaranteed maximum price for the total project. Generally speaking, the design documents should be “biddable” (75 - 100 percent complete) at the end of this phase so that the owner can be sure that he is getting accurate costs.
- **Costs and Savings Breakdown for each energy conservation measure (ECM):** For each proposed energy conservation measure, the project team should provide detailed cost information, projected annual energy savings (unit and cost), annual operational and maintenance cost impacts, financial return metrics, expected life, and environmental impacts as well as a full description of the analysis methods, calculations, data inputs, and all technical and economic assumptions.
- **Measurement & Verification Plan:** As part of the project proposal, the project team should specify the details of the M&V Plan, which IPMVP method(s) will be used, and the ongoing cost of M&V to the owner.

Ownership of the Work

While it should be clear in the contract that the owner intends to engage the project team to perform the work so long as the owner’s criteria and contract requirements are met, the contract should state that, after compensating the project team for the work, the owner will retain ownership of all analysis and other work performed during this phase, providing it is not the intellectual property of the project team.

Owner and Operator Commitment

The owner must agree to provide, to the best of his abilities, information requested by the project team as well as adequate access to the facility.

Project Schedule

The project team should propose a schedule for the design development work, and both parties must agree to act in good faith to keep to the schedule outlined in the contract.

Details of Walk-away Fee

- **Fee Amount** – The cost for design development generally varies between 10 and 50 cents⁹ per square foot, but costs could be higher or lower depending on the complexity of the project and the effort required for collecting accurate data. There are economies of scale possible, however, which can reduce audit costs per square foot in large facilities or across a portfolio of buildings. This can be expressed as a fixed cost or as a percentage of total project cost.
- **Payment Terms and Conditions** – The owner should only pay the fee if the project team finds a project that meets the owner’s/operator’s defined criteria and the owner decides not to proceed with project implementation.

Conformance with Best Practices Terms and Conditions

The contract should include clear language defining how the project team will adhere to the best practice framework requested by the owner/operator, including transparent pricing, vendor neutrality, and incorporation of CCI purchasing alliance products and pricing. The Best Practices discussion beginning on page 5 gives more detailed information.

It is important to note that after signing the design development contract there is a binding commitment on both parties, so confirming that project criteria and requirements are accurate and attainable – and that funds will be available if the project meets owner/operator criteria – is critical at this stage. If the owner

is not able to proceed with the recommended project after the project proposal is presented because of an inability to secure financing, the owner will likely still be liable for the negotiated “walk-away fee.” The owner should consult with legal counsel to review contracts if additional expertise is required. See additional resources for Design Development contract examples.

CONDUCT DESIGN DEVELOPMENT (INVESTMENT GRADE AUDIT) TO REFINE PROJECT SCOPE

The time required to complete design development varies according to the facility’s size, complexity, and the availability of data, but typically takes about three to six months. Building staff will need to budget sufficient time to interface with the project team and to ensure that the team has adequate access to the site and any additional data needed to conduct their analyses. During the process of design development, project scope is refined through an iterative process according to the owner’s financial and other criteria. ECMs that do not appear feasible should be eliminated, and those that appear likely to be feasible should be explored further.

In evaluating ECMs for inclusion in the final scope, owners should bear in mind synergies between ECMs, operations & maintenance savings, environmental benefits, and other relevant decision factors described in the Best Practices section above. At the end of this process, the Owner should have a firm and final project defined, along with an M&V plan and all of the numbers and documentation needed to assess the investment opportunity. Please see the Additional Resources section for a sample ECM Screening Tool that can be used to facilitate this process.

As discussed above, the design documents should be complete enough to enable the project team to propose a final lump sum or guaranteed maximum price for the work. Before proceeding to the construction contract, the parties should be able to confirm that the proposed pricing is in line with market rates. While the intent is for the project team to implement the final scope, this confirmation lends greater confidence in the process

and helps the owner meet any competitive bidding requirements from partners, investors, or management agreements.

SECURE FUNDING

Based on the scope of work and the cash flows detailed in the final product proposal, the owner can seek financing from various sources. The Finance section below expands on this topic. It is advisable that owners seek potential sources of funding in the pre-project planning phase to avoid delays and potential termination of a project.

PHASE 3 – PROJECT IMPLEMENTATION

NEGOTIATE CONSTRUCTION CONTRACT

Once the scope of work has been finalized, the design completed, and the guaranteed maximum price negotiated, the owner and the project team proceed to negotiate the construction contract. The industry-vetted BOMA/CCI contract template covers the construction, performance guarantee (if desired) and ongoing M&V phases of the project. It is intended to standardize most key aspects of these complex processes and address the key issues related to M&V, performance guarantees, and other aspects of the process. Depending on the owner's preferences, there may be one contract with the project team or individual contracts with each team member.

Many owners will be able to use the contract in its current template format, allowing the owner to focus on price and scope of work, much like the American Institute of Architects' (AIA) construction contracts. However, BOMA and CCI recommend each owner seek appropriate legal counsel before entering into any binding agreement. The BOMA/CCI contract template and additional information can be found in the Additional Resources section.

IMPLEMENT FINAL PROJECT SCOPE

As in the design development phase, the owner will need to budget time to assist the project team in staging the installation of the ECMs. Construction may go on for over a year, and since the project team is often working on systems that affect occupied space, there may be a need to perform work after-hours or provide swing space for tenants. This obviously affects the cost and timing of the project and should be addressed early in the process before the construction phase.

The M&V plan developed in the design phase should supply sufficient data to monitor post-retrofit performance. M&V infrastructure and services can be funded as part of the total project cost and should be identified in preliminary and IGA proposals since this metering infrastructure will be installed at the same time as the ECMs. Further discussion on M&V and its crucial importance can be found on page 8.

COMMISSION ALL INSTALLED EQUIPMENT & RETRO-COMMISSION IMPACTED SYSTEMS

As ECMs are installed, it is critical that each piece of equipment and the affected systems are properly commissioned. To avoid potential conflicts, the owner may require commissioning to be carried out by a third-party specialist. Further discussion can be found on page 7 in the Getting Started section. Proper commissioning ensures that the ECMs perform as designed and that the owner is getting the full value of the retrofit.

PROJECT HAND-OFF, STAFF TRAINING, AND UPDATING OF O&M DOCS

Following project implementation, proper training is critical to ensuring the continued performance of the building. The project team should provide training on all systems, not just those that were replaced or adjusted. The project team should also work with relevant existing service contractors to ensure that they are reliable sources for service of each of the critical systems included in the work. These service contractors, as well as the building staff, should be included in the implementation phase wherever possible in order to enhance their ability to provide effective long-term support for the optimized facilities. By including existing/preferred vendors in the process, the vendors also get an introduction to the cultural changes that are occurring within the building operations team. BOMA also provides ongoing educational programs, such as the six-course curriculum known as the BOMA Energy Efficiency Program (BEEP) and the Sustainable Operations Series (SOS), to help support the sharing of on-going best practices in operational excellence.

PHASE 4 - MEASUREMENT & VERIFICATION MONITOR POST-RETROFIT PERFORMANCE

The mere presence of new equipment does not guarantee optimal performance; M&V is absolutely critical to the long-term success of any energy retrofit project. The owner and the project team each have responsibilities in this ongoing process, as outlined in the contract. Many owners are more than capable of monitoring performance and taking necessary actions to ensure that the desired outcomes are achieved. However the owner may wish to request a proposal for such ongoing services as part of the original proposal solicitation, or may elect to, execute a separate contract with a third party M&V provider.

Whether performed in-house or by a third party, M&V should be carried out in accordance with the International Performance Measurement & Verification Protocol (IPMVP). Additional levels of M&V can be arranged to achieve LEED requirements or to calculate and document the reduction in GHG emissions for purposes of carbon accounting. Appendix 2 gives further information on this topic.

IMPLEMENT PREVENTATIVE MAINTENANCE PLAN & TAKE NECESSARY CORRECTIVE ACTION

Systems tend to drift from their optimal settings after implementation and new issues arise over time as building environments inevitably change. Measurement of post-retrofit performance is only useful to the extent that corrective action is taken as issues are identified. This process has been termed “Monitoring-based Commissioning” and refers to the process of monitoring building use and performance and optimizing building operations on a continuous basis. As with the M&V, this function can either be carried out with in-house resources or may be contracted to a third party.

FINANCING

CCI works with financial institutions to improve building owners' access to cost-efficient capital for energy efficiency projects, either through the use of existing financial products or through the development of entirely new funding mechanisms. CCI works with leading financial institutions that have a track record in executing energy-related financing or have otherwise demonstrated a serious commitment to retrofit financing.

THE ROLE OF CCI

CCI assists building owners who undertake energy efficiency retrofit projects in the following ways:

- Help the owner identify the key variables that will affect the financial feasibility of a project. These variables include – but are not limited to – project scope and payback, current financial market conditions, owner constraints, and finance related objectives
- Aid the owner in determining the most likely options for financing given the key variables in the project
- Connect owners with the appropriate financial institutions given the type of project being undertaken and the owner's need for outside capital. CCI will use its existing institutional relationships and its knowledge of the retrofit finance market to expedite this process for building owners
- Serve as a resource and intermediary during the deal structuring and term sheet negotiation processes as needed, helping both building owner and financial institution reach a consensus on terms and other potentially novel aspects of the deal

CCI can help building owners formulate and communicate their needs to the financial community. Beyond that, building owners can determine the extent of CCI's involvement. This may entail soliciting proposals, conducting initial financial modeling, exploring non-traditional methods of financing in partnership with others, or conducting research on specific issues. CCI also helps owners with longer-term plans for retrofit projects to begin to explore financing options.

METHODS FOR FINANCING ENERGY EFFICIENCY BUILDING RETROFITS

This section outlines various financing options and approaches for the commercial building sector, including privately and publicly available funds in the United States. Common financing products and mechanisms as well as emerging methods are discussed.

PRIVATE DEBT MARKETS

- Commercial leases, including capital and operating leases
- Non-recourse and limited-recourse loans
- Receivables Purchase Agreements (“RPAs”) – An RPA is a structure whereby the building owner pledges the projected future stream of project-generated energy and operational cost savings to a contractor. The contractor then sells this pledge of future cash flows, minus annual monies earmarked for operations and maintenance of the installed equipment, to a third party financier. In exchange for selling this future stream of funds, the contractor receives a lump sum payment from the third party financier. The contractor uses the proceeds from that sale to implement the energy efficiency project.

STRUCTURED FINANCE APPROACHES FROM NON-TRADITIONAL LENDERS

- Shared Savings Agreements – Under a shared savings agreement, a private company offers to implement an energy efficiency retrofit in exchange for a portion of the energy cost savings.
- “Managed Energy Services Agreement” Model – One emerging type of finance structure, offered by the firm Transcend Equity Development (TED), is known as the MESA, or “Managed Energy Services Agreement,” and allows building owners to finance their projects “off balance sheet.” Under the MESA structure, TED makes improvements to the building owner's property at no upfront cost to the building owner. Instead, TED will invest its capital into comprehensive improvements in a building owner's portfolio. In exchange, TED effectively becomes the building's energy supplier by taking over payment of the

building's utility bills and creating an operating expense that replaces the building owner's utility expenses set equal to historical energy costs. TED thereby earns a ROI from the efficiencies generated by the improvements. At the expiration of the MESA, the building owner reclaims responsibility for paying substantially lowered utility bills.

EQUITY

- A variety of institutional investors, including pension funds and life insurance companies, have been exploring the potential to invest in energy efficiency projects as a new investment class.
- Equity funds typically require a new leveraged fund vehicle to be created in order to invest in projects – and will need to identify a fund manager with sufficient expertise.

INCENTIVES AND REBATES

Utility rebates and incentives vary by geography and utility service area. The DSIRE database, available at www.dsireusa.org, provides a good resource for identifying which rebate and incentive programs may be available to a particular building owner.

UTILITY ON-BILL FINANCE PROGRAMS

These programs may provide a source of funding for commercial energy efficiency projects. They are typically operated by utilities and offer building owners low or no-cost loans to make energy efficiency improvements; the loans are then repaid through the utility bill.

TAX CREDITS AND DEDUCTIONS

- New Markets Tax Credits (NMTC) – The NMTC program may offer certain commercial building owners with projects located in low-income communities a way to finance a portion of their energy efficiency retrofit project. The NMTC program allows for the proceeds from the sale of a 39 percent tax credit to be used to invest in projects that benefit low-income communities. More information on this program can be found here: www.cdfifund.gov/what_we_do/programs_id.asp?programID=5

- Federal Tax Deduction for Commercial Buildings – A tax deduction of \$1.80 per square foot is available to owners of new or existing buildings who install (1) interior lighting, (2) building envelope, or (3) heating, cooling, ventilation, or hot water systems that reduce the building's total energy and power cost by 50 percent or more in comparison to a building meeting minimum requirements set by ASHRAE Standard 90.1-2001. More information is available here: www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=US40F&re=0&ee=1

PROPERTY ASSESSED CLEAN ENERGY (PACE) FINANCING

PACE financing programs allow for private building owners to finance energy efficiency and/or renewable energy improvements to their properties and repay the loan through a voluntary assessment that is added to the building's property tax bill. These assessments can last up to 20 years, depending on program design, and can be structured to cover the financing costs of the project as well as design fees, project management, and other soft costs.

To date, PACE programs have typically relied on municipal bond issuances as the source of funding (e.g. the "Berkeley Model"). However, CCI and Hannon Armstrong have been working to develop an "owner-arranged" financing approach for large commercial buildings participating in PACE programs. This concept would allow commercial property owners to arrange lease financing, which can be secured by a contractual assessment on the property tax bill.

Benefits of the PACE financing structure are as follows:

- Provides lenders/investors with greater security as repayment risk is tied to the entire property (e.g. investors obtain a super priority lien on the property, ahead of the first mortgage)
- May overcome owner credit, lack of collateral, split incentive, and holding period bias as barriers to investment

- Because PACE assessments are assigned to the property and not the owner, debt repayment can likely be stretched over a longer term. This has the effect of reducing the size of annual or semi-annual assessments, resulting in projects that are at least “budget neutral” (i.e., savings adequately cover debt service).

More information can be found at: www.pacenow.org.

ADDRESSING FINANCING BARRIERS IN THE COMMERCIAL BUILDING SPACE

Financing commercial building retrofits projects is particularly challenging in this period of economic downturn. The financing structures on pages 21-23 aim to address certain aspects of commercial real estate finance that have precluded the use of third party finance for energy efficiency projects, including:

- Buildings are often owned by unrated, limited liability “shell” entities

- Buildings are often fully pledged under a mortgage and potentially mezzanine investment
- Third party interests are often subordinate to existing lien holders
- Third party liens on real property improvements (e.g. new chiller) are typically disallowed

As a result of these impediments, prospective retrofit lenders are left with few, if any, mechanisms to secure their investments. While there is no “off the shelf” financial solution for this sector, CCI is bringing financial institutions and building owners together to find practical and creative ways to address these barriers. Building owners who would like to play a more active role in helping to define retrofit finance for the commercial building market are encouraged to contact CCI, as are building owners with projects which could be used as a test pilot for innovative financing solutions.

CCI BUILDING TECHNOLOGY PROCUREMENT SUPPORT

CCI has developed agreements with leading technology suppliers in order to accelerate the adoption of energy efficient building technologies worldwide. These relationships, which include preferential pricing and project support, are available to building owners who are partners of CCI’s Energy Efficiency Building Retrofit Program. On behalf of building owners, CCI facilitates connections with technology suppliers and provides third-party oversight on pricing.

CCI PRICING AGREEMENTS

CCI negotiates price reductions on energy-saving technologies by leveraging the incremental sales opportunity presented by CCI’s global partner base. Pricing in these agreements is meant to serve as a ceiling, and represents the best price for a particular product in a particular market from a particular vendor. Owners should not expect that CCI partner bids will always be the lowest across the board, but the best price available

in their market from top-flight firms that have partnered with CCI.

CCI’s supplier partners expect to work within existing bid processes. It is not CCI’s intention to work outside of existing bid processes, but to help owners arrive at the most competitive price point while achieving the most energy savings possible. Owners can and should engage in competitive bid processes which may result in lower prices than have been agreed to by CCI.

PRODUCT SELECTION CRITERIA

CCI has chosen building technologies and supplier partners based on several criteria:

- Ability to reduce energy use and greenhouse gas emissions
- Applicability to retrofit opportunities

- New and or emerging technologies with price structures that can be influenced by incremental volumes and economies of scale

THE ROLE OF THE CCI IN BUILDING TECHNOLOGY PROCUREMENT

In addition to providing access to price discounts on energy efficient technologies, CCI offers a suite of services including technology selection assistance and facilitation of competitive bid processes. CCI serves as a resource to help building owners identify and implement cutting-edge technologies in a supplier-agnostic manner. CCI works with owners to verify price

points and to ensure suppliers have bid in accordance with the obligations of their CCI agreements. The only criterion for accessing these services is that owners/contractors are working actively with CCI on their building retrofit project.

CCI is not supported by any entity that has an economic stake in its success, including all supplier partners.

Example: Technologies and discounts available through the CCI PA

Category	Subcategory	Suppliers	Discounts
Envelope Products	Solar Control Window Film	Bekaert Specialty Films, 3M	15-45%
	Reflective Roofing	Tremco	15-20%
	Spray Foam Roofing	BASF-PFE	25-35%
Central Cooling Products	Large Tonnage Chillers	Carrier Corp.	5-20%
	Modular Chillers	Multistack	15-25%
	Solar Cooling	Climatewell	15-25%
	Chiller Plant Optimization	Optimum Energy	25-35%
Lighting Products	Flourescent and HID Lamps	GE, Osram/Sylvania, Philips	5-25%
	Fixtures	Acuity, Cooper	5-25%
	Ballasts	GE, Osram/Sylvania	5-25%
	LED	Lemnis, Cree, LLS	5-25%
	Wiring, Controls, Emergency Lighting	Acuity, Cooper	5-25%

APPENDIX 1: RESOURCES

The following documents can be found at: <http://www.boma.org/SiteCollectionDocuments/Org/Docs/Resources/retrofittingtoolkit.zip>

- Sample RFQ/P for Energy Efficiency Retrofit Services
- Property Information Summary
- Financial Return Evaluation Tool
- Proposal Evaluation Matrix

- Sample Design Development Contract
- Sample Construction Contract
- Case Study and Sample Contract: Empire State Building
- Case Study and Sample Contract: Citi Group Global Retrofit Program

APPENDIX 2: MEASUREMENT & VERIFICATION – THE IPMVP

In the early 1990s there were a variety of M&V protocols competing in the United States, until 1996, when the U.S. Department of Energy (DOE) provided impetus and funding to harmonize existing protocols. Over 150 volunteers (owners, financiers, contractors, consultants, academics, utilities) from 15 countries collaborated to write the International Performance Measurement and Verification Protocol (IPMVP), the primary purpose of which is to give reassurance to the building owner that energy savings are being calculated in a consistent and accurate way. In 2001 DOE transferred responsibility for IPMVP to the Environmental Valuation Organization (EVO), a non-profit supported by subscribers to the IPMVP.

The IPMVP is the most widely referenced and internationally accepted framework for ‘measuring’ energy or water savings resulting from an efficiency upgrade. IPMVP presents common terminology and defines full disclosure to support rational discussion of often contentious M&V issues. However, while IPMVP documents the state of the art, it does not specify how exactly a project’s M&V should be designed. An M&V engineer is still needed to apply IPMVP principles to the ‘measurement’ of savings for any energy efficiency project. Please see Appendix B for more information on best practices in M&V and background on the IPMVP. IPMVP identifies four main M&V options for EPC projects:

Option A is designed for projects using spot measurements of pre- and post-energy use together with agreed-to operating hours for estimating savings. Periodic equipment inspections also may be required to verify equipment condition.

- Option A costs from one to five percent of construction costs and provides an accuracy of +/- 20 percent.

Option B requires continuous or repeated measurement of pre- and post-energy use for specific equipment or a sampling of equipment. Sub-metering is typical of this approach.

- Option B costs from three to 10 percent of construction costs with an accuracy of +/- 10 to 20 percent.

Option C makes use of the main building meters to measure savings from all project efficiency measures. This approach involves continuous analysis of metered data.

- Option C, with monthly data, costs from one to three percent of construction costs and provides an accuracy of +/- 20 percent.

Option D uses a calibrated computer simulation of pre- and post-installation energy use to measure project savings.

- Option D costs between three to 10 percent of construction costs and provides an accuracy of +/- five to 10 percent.

More information about M&V and the IPMVP can be found at: <http://www.nrel.gov/docs/fy02osti/31505.pdf>

ACKNOWLEDGEMENTS

ARUP

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Arup is an independent firm of designers, planners, engineers, consultants and technical specialists offering a broad range of professional services. Through our work, we make a positive difference in the world. We shape a better world.

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Bovis Lend Lease is part of the Lend Lease group, a leading global real estate services business, having developed, constructed and managed real estate assets around the world for over 50 years. A proud supporter of CCI, Bovis Lend Lease can provide a turnkey solution from the analysis to the execution of providing an improved energy efficient building. Our services can be tailored specifically to meet your needs and can help implement sustainable solutions for a single building to an entire portfolio of buildings.

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Citi Realty Services

Citi Realty Services (CRS) is responsible for global facilities operations, project management and engineering services across Citigroup's global real estate portfolio. CRS is currently developing 16 million square feet of building energy efficiency projects building with the BOMA/CCI best practices framework and template contracts. In developing these projects, Citi worked with BOMA/CCI to enhance and improve the BOMA/CCI Energy Efficiency Contracting Toolkit. Citi made several contributions to the Best Practices laid out in the most recent version of the BOMA/CCI Energy Efficiency Contracting Toolkit, including, in general, the importance to firms of having clear investment criteria by which to evaluate potential investments, and the benefits of standardizing contracts and contract terms across multiple projects.

EnerNoc

www.enernoc.com/solutions/energy-efficiency.php

EnerNOC unlocks the full value of energy management for our commercial customers by reducing real-time demand for electricity, increasing energy efficiency, improving energy supply transparency in competitive markets, and mitigating emissions.

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Gerding Edlen Sustainable Solutions

www.gerdingedlen.com

Gerding Edlen Sustainable Solutions (GESS) provides developer-led retrofit and distributed infrastructure services to public and private real estate portfolio owners. As a program manager and owner's representative, we bring a unique developer perspective cultivated over 14 years of green building development. GESS provides the full breadth of retrofit services, assessment through implementation, including the arrangement and assembly of financing.

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McKinstry

www.mckinstry.com

Established in 1960, McKinstry is a full-service design, build, operate and maintain (DBOM) firm with over 1,600 employees and \$400 million in 2008 annual revenue. McKinstry's professional staff and trades people deliver consulting, construction, energy, and facility services. As an early adopter of the DBOM process, the company advocates collaborative and sustainable solutions that are designed to ensure occupant comfort, improve systems efficiency, reduce facility operational costs, and ultimately optimize client profitability for the life of their building.

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Perkins + Will Architects

www.perkinswill.com

Perkins+Will has the vision and experience to build an environmentally sustainable future. It has been advocates of sustainable design since Larry Perkins and Phil Will founded the firm in 1935, and has been designing award-winning sustainable buildings ever since. Most recently, Perkins+Will earned the #1 ranking in Sustainable Design by Architect magazine in 2009 and 2010. Perkins+Will is perfecting its sustainable design skills at a time when clients are increasingly becoming aware of the financial, social and environmental benefits of sustainable buildings. Their pledge is to further its mission through the pursuit of new solutions, the sharing of knowledge, and the creation of ideas and buildings that honor the broader goals of society. Perkins+Will is committed to the 2030 Challenge and has created the industry's first publicly released Precautionary List for substances commonly used in building products, online at <http://transparency.perkinswill.com>.

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Senior Project Designer

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Rushing Company Design Engineers

www.rushingco.com

Rushing's approach is a refreshing change from traditional MEP engineering and sustainability consulting firms. We're not afraid to look for an unexpected angle or unique solution and work closely with our clients to find practical, field-tested, and construction-ready solutions.

Rae Anne Rushing

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Transcend Equity Development

www.transcended.com

Transcend Equity Development Corporation is an energy systems developer that sources capital for major retrofit projects in existing buildings. Its proprietary transaction structure called a Managed Energy Services Agreement (MESA) makes Transcend responsible for paying a property's utility bill and allows Transcend to bill historical energy usage and to retrofit the building, usually co-developing with a landlord's preferred engineers and contractors. The investment imposes no debt or liens that could violate a mortgage and has been validated multiple times as balance sheet neutral to the landlord and as a GAAP-auditable operating expense to the tenant.

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USAA Real Estate Company

www.usrealco.com

With more than \$5 billion in assets, USAA Real Estate Company provides co-investment, acquisition, build-to-suit and development services for corporate and institutional investors. Specializing in office, medical office, industrial, public sector, retail, land and hotel properties, USAA Real Estate Company offers outstanding opportunities to invest, sell or lease commercial properties in major national markets. With a commitment to excellence in service, it delivers real estate and business solutions in a manner that reflects the values of its parent company, USAA, a worldwide insurance and financial services organization.

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Vulcan Inc.

www.vulcan.com

Vulcan Inc. is the Seattle-based company founded by Microsoft co-founder Paul G. Allen to manage his business and philanthropic efforts, including the Paul G. Allen Family Foundation and Vulcan Productions, the award-winning producers of feature films and documentaries. Allen is one of the country's top philanthropists, and his investment portfolio includes holdings in real estate, sports, communications, technology and energy.

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ENDNOTES

¹ “The Cost of Green Revisited,” Davis Langdon, July 2007; “Does Green Pay Off?” By Norm Miller, Jay Spivey and Andy Florance Draft date Nov. 19, 2007; “High-performance Green Building: What’s It Worth?” Theddi Wright Chapelle, Chris Corps, May 2009; “Real estate: Sustainable investment approaches,” UBS Education Note, Agathe Bolle, June 3 2009; “Value Beyond Cost Savings,” Scott Muldavin, 2010; “Do Green Buildings Make Dollars and Sense,” CBRE - Dave Pogue, USD – Norm Miller, 2010; etc

² This is the same concept used to develop predictive models for other purposes such as projecting future median home prices as a function of employment, GDP, inflation, and rental rates. Essentially, through regression analysis, the program finds the equation for the line that most closely mirrors the value of a certain “dependent” variable as a function of other related “predictor” variables.

³ Please see Appendix 1 for further discussion of the IPMVP and its origins at the Department of Energy

⁴ “Building Commissioning: A Golden Opportunity for Reducing Energy Costs and Greenhouse Gas Emissions,” Lawrence Berkeley National Labs – Evan Mills, July 21 2009

⁵ Please see Appendix 1) Project Delivery Methods, for “Pros and Cons” of different Project Team structures.

⁶ Please see Financing section on page 22 for further discussion of tenant pass-throughs.

⁷ This stipulation is included to discourage project teams from inflating savings estimates or underestimating costs in the PA stage.

⁸ This stipulation is included to assure the project team that they will be fairly compensated so long as they can deliver a project that meets the owner’s investment criteria.

⁹ According to CCI experience and research