State of Idaho

GUIDE TO ENERGY PERFORMANCE CONTRACTING

A Guide to Implementing Energy Efficiency Retrofits That Will Upgrade Facility Infrastructure and Reduce Energy Consumption and Facility Operations and Maintenance Costs

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Executive Summary

This guide is designed to assist state, cities, counties, school districts and universities in development and implementation of energy performance contracts as provided under Idaho Statute, Title 67 Section 67-5711D. The guide contains step-by-step instructions of the energy performance contracting process and lists typical equipment and services that may be procured under a performance contract. Section 67-5711D of Idaho code is included at the end of the guide and it is recommended that the Customer undertake legal review of the statute previous to issuing an RFQ for energy performance contracting services.

Energy performance contracting may best be considered a "tool" for pursuing cost-avoided energy savings through energy efficiency improvements of facilities and other non-building related energy uses such as streetlights and sewage treatment plants. It may not always be the best approach to take and may be most effectively utilized when it is considered as one of the available options when developing a strategic plan for energy and facility operations savings for the Customer.

Glossary of Terms

Comprehensive Energy Audit – is an investment-grade, computer-modeled audit yielding guaranteed energy savings and scope of work.

Energy Conservation Measure (ECM) – are measures that consist of a wide variety of equipment and process designs that are more energy efficient than the equipment and processes they are replacing. As a general rule, these measures should have a cost-avoided payback term that does not exceed the expected life-cycle of the specific ECM.

Energy Service Company (ESCO) – is a company engaged in developing, installing and financing comprehensive, performance-based facility improvement projects, typically 10-15 years in duration, centered on improving energy efficiency and reducing maintenance costs. ESCOs comprise a variety of different types of companies--from very large to very small-- including engineering firms, equipment manufacturers, e.g., DDC companies, mechanical contractors and design-build construction firms. Most states, including Idaho, mandate a minimum size to insure the ESCO has the financial ability to guarantee the project's long-term performance.

Energy Savings Performance Contract (ESPC) – is a contract between the customer and the ESCO for performance-based energy efficiency and facility improvement retrofits to existing buildings. This includes energy-related facilities (such as stand-alone central heating/cooling plants) in support of existing buildings. This contract establishes the procurement methodology for the design, delivery and performance verification of a project. ESPC uses an integrated construction and procurement methodology. It includes the following benefits:

- ESPC provides a better alternative to traditional "low-bid" process, by implementing designs, systems and equipment that ensure better life-cycle performance and the lowest total cost ownership over time.

- ESPC mandates the ESCO is a turn-key provider and single point of accountability on the project.

- The operational and financial risks are born by the ESCO.

- ESPC mandates an open-book cost-plus, fixed fee/markup to a guaranteed maximum (GMAX) pricing for full disclosure, transparency and cost-competitiveness.

- ESPC mandates that projects are properly commissioned.

- ESPC provides three primary guarantees: cost-avoided energy/O&M savings, GMAX pricing, and life-cycle performance.

- ESPC requires continuous monitoring and validation to document energy savings. This process also educates and involves the Customer in building performance.

Feasibility Energy Analysis (FEA) – is a preliminary energy assessment of project feasibility yielding potential savings and cost analysis.

Performance-Based Energy Efficiency Retrofit – is a retrofit which energy savings are measured and verified (based on assumptions regarding the level of operations and the cost of energy being saved) and the ESCO is paid only from total cost-avoided dollar savings actually produced by the project. This performance requirement distinguishes ESCOs from consulting engineers specializing in efficiency improvements. The latter typically are paid a fee for their advice and do not assume the risk that their recommendations will yield actual dollar savings or energy consumption reductions.

Performance/Payback Period – is the amount of time required to recover the cost of the installation of new equipment if all savings were applied to that cost without taking into account the cost of any financing. The payback period for an energy efficiency retrofit generally is independent of the contract term and varies for different types of equipment. For example, a high efficiency lighting retrofit might pay for itself in 5 years or less, whereas an HVAC replacement or an energy management system (EMS) installation may produce a payback of 15 - 25 years. By combining the two ECMs in one project, the shorter payback on the lighting portion can be used to subsidize the cost of the longer payback item, providing a total payback period of perhaps 10 - 25 years depending on the final scope of work. Funding protocols require that the total integrated project must not have a total life-cycle expectancy of less than the finance term. For example, a simple lighting retrofit may be unable to receive funding for a term greater than 10 years. However, a project that includes major mechanical system upgrades should be able to receive funding for a term of up to 25 years. As a rule, most ESPC projects have a contract term of not greater than 20 years. In addition, other capital improvements, e.g., new boilers, generators, steam plants, CFC-free refrigeration units, or power plant housings – can be folded into the project and the costs covered, or, at least partially subsidized, out of the energy cost savings. In the State of Idaho a performance contract term may not exceed twenty-five years as mandated by Idaho Code §67-5711D(8)(b).

Project Development Agreement (PCA) – is a formal agreement between the Owner and ESCO outlining the scope, goals and cost for developing the preliminary project engineering design, energy modeling and project GMAX pricing. This agreement can be divided into several stages allowing for both Customer and ESCO to re-evaluate the project.

Guaranteed Maximum (GMAX) Project Cost Pricing) – is a fundamental component of a Performance Contract that the ESCO provides to the Customer is a guaranteed maximum (GMAX) price on the project. Once the investment-grade analysis and project development portion is completed, a final scope of work will be negotiated and confirmed between the Customer and the ESCO. The ESCO should then issue a GMAX price for this scope of work as part of the implementation contract. This is a "not to exceed" price that provides the Customer with another level of protection against risk and it is particularly useful in projects that are funded with General Obligation Bonds. This GMAX price will include all contingencies, services etc. In many cases contingencies of 5-10% are common. Alternate/optional scope of work or services will be a separate proposal that includes additional pricing. The GMAX price should allow the Owner to issue change orders or additional scopes of work, for which additional costs will be applied. However, the GMAX should prevent most, if not all, change orders initiated by the ESCO. Essentially, if the ESCO/Contractor made a mistake in estimating costs, or they made an error in their calculations, then the cost to fix this should be burdened by the Contractor once the GMAX pricing is achieved.

Detailed terms and conditions can be negotiated as part of the GMAX price. These can include annual labor escalation rates, term of the GMAX implementation guarantees and exclusions, such as "Acts of God", etc. In almost all cases the GMAX will represent a larger figure for which the project will be actually implemented. This protects the ESCO from unknown of unforeseeable problem. Because an open-book pricing model is utilized in ESPC, should the project be completed for less than the GMAX price, then the construction savings and any unused contingency money should always be returned to the Customer. Shared savings or shared contingency models are not advised. The Customer is then free to keep or spend the surplus on additional or alternate work.

Request For Qualifications (RFQ) – is the procurement document that defines specific criteria that ESCOs must possess to win project award. Although selection is based on overall qualifications, the criteria include project markups, cost of energy audit, contract terms, etc.

Energy Performance Contracting

What is it?

In 2000, Idaho passed the Energy Savings Performance Contracting (ESPC) Enabling Legislation (I.C. §67-511D). Performance contracting provides a way for public institutions (K-12, higher education, state, cities, and counties) to leverage future cost-avoided energy and operation and maintenance (O & M) savings, to pay for improvements in the comfort, safety, and energy and operational efficiency of their facilities today. The financial and operational performance is guaranteed by the ESCO, eliminating the risks usually associated with the traditional "low bid" approach to construction projects. In sum, it is a methodology that helps public institutions fund much needed ECMs to upgrade facilities and reduce their energy use by a significant amount—typically 20 – 30%. ESPC focuses on existing buildings and energy-related systems, e.g., boiler and chiller plants that support existing buildings. Currently, there are over 46 states that employ ESPC enabling legislation, in addition to the federal government. This methodology has become enormously successful with public institutions throughout the United States.

Energy savings performance contracting provides an innovative financing approach for public institutions to implement improvements to their facilities for up to a financing term of 25 years. The ESCO will guarantee that the cost-avoided energy and O & M savings produced from facility and efficiency upgrades will cover all debt service. However, ESPC allows for additional capitalized facility improvements to existing buildings that are not necessarily energy-related. For example, roofs in need of replacement; electrical system upgrades; new ceiling grids; window framing and other structural or envelope improvements; fire sprinklers and other life safety equipment. These are just a few facility improvement measures that perhaps are not cost-justified through energy savings, but which are allowed as part of a performance contracting project. What this does **NOT** include is expanded facility square footage - such as adding a band room or new gymnasium.

Many agencies face increasing energy costs and the need to replace worn-out equipment, but lack the funds, expertise and resources to make building improvements. Below is energy savings performance contracting three distinguishing features that address this and other common problems:

- A single procurement is used to purchase a complete package of services in which one contractor is accountable for design, purchase, installation, commissioning, maintenance, and operation and verification of the ECMs to ensure optimum performance;

- An integrated process is used that focuses on the best life-cycle performance – not lowest first costs – in determining the best equipment, designs, systems, etc.; and

- The package of services includes financing of all the project costs, so the Customer has the option of having no up-front funds. An energy performance contract is structured so that, if preferred, payments on the debt service can be tied to the actual level of cost-avoided savings achieved or energy produced. Since cost-avoided savings must financially and operationally justify the facility improvements, it is in the contractor/ESCO's interest to maximize the energy savings resulting in an increase in cost-avoided savings for the customer. ESCOs are required to provide and guarantee the maximum project costs with no contractor change-orders being allowed

How is Energy Savings Performance Contracting Different?

Conventional Contracting

A conventional process to purchase energy-efficiency improvements often requires four separate solicitations and contract awards. First, an agency solicits engineering services for an energy study. After reviewing the completed study, the agency selects the improvements to be implemented and solicits proposals for engineering design services. Once the designer completes a plan and specifications, the agency issues one or more invitations to bid to select contractors who will install the improvements. Finally, the agency invites bids to request preventive maintenance services for any equipment the facility is not maintaining with in-house staff. Unfortunately, this "bid-spec" or "low-bid" process ultimately results lower-performance as first-costs are the determining factor in the process. In addition, projects are not properly commissioned nor any contractor held accountable for the long-term financial and operational performance of the project. Promises are made without any quantifiable measurement, monitoring, verification, or performance assurance.

Energy Savings Performance Contracting (ESPC)

Energy performance contracts replace this cumbersome collection of solicitations and contracts with a single request for proposals covering all aspects of the project and one contract with the selected proposer. The ESPC Contractor is the single-point of accountability throughout the project—from concept to ongoing measurement and verification. All engineering and analysis is investment-grade, meaning the financial and operational performance is guaranteed.

The process begins with an evaluation of a facility's potential for efficiency improvements by the facility staff. If the potential seems promising, the agency prepares a Request for Qualifications (RFQ). This RFQ covers all engineering, construction, and maintenance services needed to complete the project. Competitive selection is strictly governed by the RFQ process whereby all costs, markups and methodologies are exposed by the Respondents. Open-book pricing that mandates cost-plus, fixed-fee to a guaranteed maximum (GMAX) project cost are required of all ESCOs. The Customer awards the contract to a single ESCO who is accountable for all services, pricing, project performance and cost-avoided savings.

Once selected, the performance contractor performs a comprehensive or investment-grade energy audit of potential ECMs at the facilities. The facility staff and administration (Customer) reviews this study and approves a final list of ECMs. The contractor then prepares plans and specifications that the Customer reviews and approves. After receiving notice to proceed, the contractor furnishes, installs, and commissions the ECMs after which ongoing performance verification continues for the negotiated term of the contract. The Customer monitors the day-to-day performance of the contractor during the construction process in the same manner that they would for a large repair and maintenance project. After construction is completed and accepted, the Customer, facility staff, and the ESCO monitor contractor performance concerning equipment maintenance and repair, standards of service and comfort, and level of energy savings achieved.

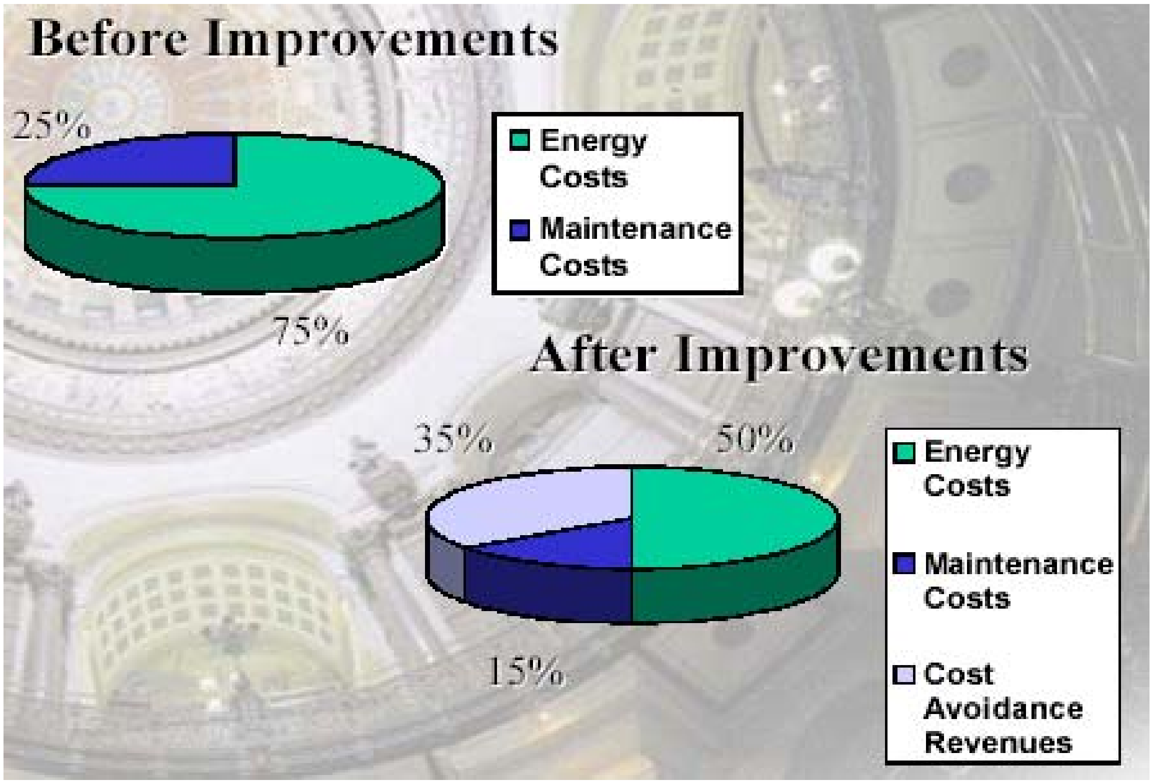

Figure 1-1 Energy Performance Contract Cost Savings

Energy performance contracting streamlines the purchasing process for energy efficiency projects, reducing the cost and time required to bring energy-saving projects on line. A single company takes responsibility for designing, building, financing, and maintaining all necessary improvements. The performance contractor often employs a team of consultants and subcontractors to accomplish this but one company is still accountable for the ultimate success of the project. This single-source accountability makes the project easier to manage than a conventional construction project. Streamlining the procurement process in this way makes it possible for agencies to implement more comprehensive projects, reduces the time and cost to manage projects, and gives on-site facility staff and users the opportunity for more input into the project design and better control of the final product. As a result, efficiency improvements acquired through performance contracts often work better, last longer, and enjoy stronger long-term support from facility administrators, maintenance staff, and building users than other energy efficiency projects.

Energy performance contracting, as its name implies, shifts much of the risk associated with an energy efficiency project from the Customer to the contractor. Idaho Code §67-5711D enables public agencies to enter into performance contracts. If cost-avoided savings exceed the performance guarantee, then the Customer keeps the surplus benefits. However, if the cost-avoided savings are less than the guaranteed amount, the ESCO must reconcile the difference annually in addition to implementing the necessary improvement to ensure the performance is met. ESCOs guarantee units of energy—not dollar amounts. As the cost of energy increases over time, the dollar value of those units of energy that are saved, increase in value. The customer often elects to factor in an annual utility/energy rate of escalation in analyzing the long-term cost justification for implementing improvements. Because the agreement transfers the financial and operational risk of project performance from the Customer, the ESCO/Contractor has a strong incentive for high quality design and construction, commissioning, preventive maintenance, and ongoing monitoring for the duration of the contract.

Further benefits of energy savings performance contracting are as follows:

- Using energy cost savings to pay for needed capital energy improvement projects;

  Budgetary concerns are acutely felt in all levels of the public sector. Financial constraints often result in the delay (and sometimes, omission) of needed building maintenance and renovation. In addition, the vast majority of government facilities were built before 1980, when modern standards for energy efficient construction became widespread. According to U.S. Census Figures, about 80 percent of local government buildings (almost 295,000) were built prior to 1980.[1]

- Reducing frequent repairs and lowering maintenance costs associated with inadequate, aging, or outdated equipment

  Energy costs are a substantial component of fixed operating costs. ESCOs provide building owners with the opportunity to reduce these costs by an average of 25 percent.

- Improving overall building management and control

  Replacing costly and aging energy equipment will improve building operating efficiency, resulting in reduced costs, less need for equipment maintenance, and improved building comfort. Employing state of the art energy technologies will enable building staff to monitor energy use and equipment performance.

- Improving building efficiency in all buildings, including new ones built only to code.

  As a rule, current building codes result in newly constructed facilities that use 25-30% more energy than is necessary. In addition, most bid-spec buildings do not implement comprehensive commissioning. As a result, energy performance contracting provides measureable efficiency improvements in over 75% of newly constructed buildings that are less than four years old.

- Complying with Executive Order 2007-05

  Idaho Executive order 2007-05 initiated greenhouse gas reduction in state agencies. By increasing energy efficiency performance contracting reduces greenhouse gas emissions. Thus energy performance contracting can be a key strategy for state agencies to comply with the reduction effort initiated by the executive order.

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[1] Daniel Sze, *Energy User News*, “Rebuild America: Partnerships for the Future,” May, 2001, p. 32.

Providing up-to-date technical training and knowledge to building managers and facility staff

ESCOs routinely provide technical training on the operation and maintenance of the newly installed equipment which results in improved building control and operation and an increased understanding of energy use patterns and new technologies.

- Improving indoor air quality (IAQ) and building comfort problems

  Studies have shown that improving IAQ increases productivity, reduces absenteeism, and reduces liability costs for building owners and operators. Improved IAQ has also been found to result in health benefits; for example, studies in schools indicate a 30 percent reduction in acute respiratory infections and a 50 percent reduction in acute non-specific health symptoms.[2]

- Increasing employee productivity with more comfortable working conditions

  Studies indicate that more comfortable working conditions reduces health and workers compensation costs, enables better worker retention, increases individual productivity, reduces absenteeism, and enhances the elimination of product defects and service errors.

- Enhancing the local economy from ESCOs' use of local subcontractors

  Benefits to economic development resulting from the use of local installation subcontractors include the creation of jobs and contributions to local economic growth. It is estimated that 1/3 of the cost of every project is spent on labor, so for every $1 million energy performance contract project, over $300,000 is expended on labor wages.

- Motivating ESCOs to develop highly efficient projects by linking their payment to project savings

  Because ESCOs guarantee the cost-avoided energy and operational savings, they have a major stake in ensuring the optimal installation and maintenance of the installed project equipment. The ESCO's goal is to maximize building and equipment efficiencies in order to achieve the guaranteed savings since the ESCO is liable for any shortfalls that occur.

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[2] C. Bayer, S. Crow., J. Fischer, "Causes of Indoor Air Quality Problems in Schools: Survey of Scientific Research," January 1999, Oak Ridge National Laboratory.

- Protecting the environment and conserving limited energy resources

  By reducing the demand for burning fossil fuels, non-renewable resources of oil, coal, and natural gas are conserved and air pollution is dramatically cut. Significant air pollutants, which are reduced, include acid rain precursors (SO_2 and NO_2), greenhouse gases (CO_2 and CH_4), particulates and ozone, air toxins (mercury, cadmium, lead, VOCs) and carbon monoxide.

The Process

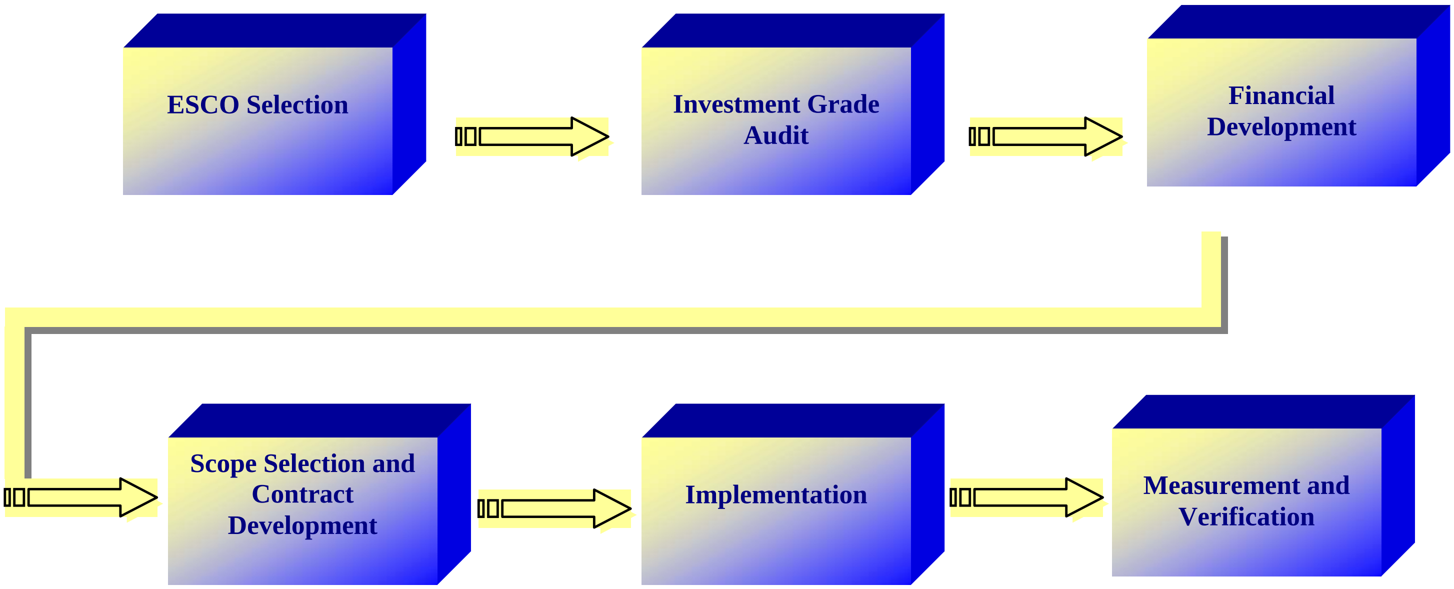

Figure 1-3 The EPC Process

Step One – Selection

The following are the steps to "Selecting an ESCO":

1. Organize a Project Team – Managing an energy performance contract requires the participation of experts from several departments, including facilities planning, procurement, budget and finance, maintenance and legal. The team will need to have diverse kinds of expertise, including:

    a. Technical expertise;

    b. Procurement expertise;

    c. Knowledge of budget and finance procedures; and

    d. Legal expertise.

2. Determine Project Objectives – What problems need to be solved? Will the ESCO provide all services from energy auditing through monitoring and verification? If not, what will be done by your staff? Will the ESCO help identify non-energy projects? Answering these questions early on makes it easier to develop the Request for Qualifications (RFQ) to solicit competitive bids.

3. Develop and Release an RFQ – The RFQ allows an ESCO to provide information about its past performance, technical experience and how it proposes to meet your objectives and needs. Sample RFQs are provided by the State of Idaho Office of Energy Resources. This RFQ provides the selection criteria necessary in making a good qualified and competitively-driven selection. The following are the main elements of the RFQ:

    a. Description of the purpose and objective of the project, including identification of the buildings to be considered, energy use, facility size and unique needs or conditions.

    b. Identification of the services desired, such as energy audit, installation, construction management, engineering design, equipment commissioning, guaranteed savings, project financing, and equipment servicing.

    c. Explanation of how proposals will be evaluated, including the evaluation criteria and weighting factors to be used. Development of objective criteria is critical for ensuring that only the most qualified ESCO is selected.

    d. Listing of the project schedule.

    e. Release RFQ to several ESCOs to ensure you get a number of responses from technically and financially qualified firms.

    f. Clearly defined selection criteria based on technical expertise, financial strength, pricing and markups, business methodologies, experience, etc.

4. Evaluate Proposals

5. Conduct Oral Interviews (if necessary)

6. Select ESCO - as a part of the evaluation and selection process include the following:

    a. Have the ESCO provide examples of when a client did not realize the full energy savings and the reasons why;

    b. Request and check references of past clients;

    c. Investigate an ESCO's organizational and financial stability;

    d. Ask colleagues about their experiences with ESCOs bidding on your project; and

    e. Have ESCO provide statements showing verification of open-book pricing and project markups.

7. Approve the ESCO and sign a Letter of Intent (LOI) or Energy Audit Agreement that allows for the preparation of the Comprehensive Energy Audit.

Step Two – Investment Grade Audit Process

Investment-Grade Energy Audits – A major reason for the success of an energy management project is the Investment-Grade Energy Audit/Analysis. The purpose of the analysis is to identify, quantify and prioritize viable energy savings opportunities for all aspects of the facility - control systems, air conditioning and heating systems, lighting, building structure (envelope), miscellaneous equipment, scheduling procedures, etc.

A thorough on-site engineering survey of the facility is made and includes measurement of electrical power usage of motors, air delivery from fans, combustion efficiency of boilers, lighting intensity levels, etc. The audit includes interviewing appropriate administrative and maintenance personnel regarding equipment usage, operating schedules, etc. This data is then used to rebuild the facility as a computer energy model. Definitions of building shape, size, construction, occupancy, lighting, temperatures, schedules, controls, plug load, weather locale and other details are used to create the model. The computer then simulates the energy use of the facility for a year; taking into account the changing effects of weather, schedule variances, etc. To verify the accuracy of the model, the simulated energy usage is compared and calibrated to the history of monthly energy bills for the facility over a three-year period. The calibrated model then becomes the “baseline”.

All viable energy conservation measures (ECMs) are then put in to the model and simulated over a full year of to determine their energy savings. “Packages” of ECMs are evaluated in the model to observe the interactive effects of the measures. Questions such as, “What savings are generated by implementing lighting, HVAC and controls measures as a package?” are answered.

Next, a cost estimate of each ECM is determined, and the project’s cost effectiveness is reviewed. The estimate entails developing schematic diagrams and performance specifications. Price proposals are solicited from subcontractors.

The resulting audit report should include a list of each viable energy savings modification with predicted annual savings, cost of implementation, and financial payback. With this report ESCOs are able to assemble the most cost-effective group of energy savings opportunities possible - those that provide the greatest possible savings for the least investment.

The typical structure of the audit is as follows:

1. *“Executive Summary”* – This section provides an overview of the project.

2. *“Existing Infrastructure and Energy Consumption”* – This section provides a month-by-month listing of historical energy use. From this information, an energy use baseline is determined *(this baseline is used to calibrate the energy model described above).* From this baseline, energy savings are calculated during the monitoring phase. Utility rates and energy usage

3. *“Future Utility Price Assumptions”* – This section shows any adjustments to utility baseline costs.

4. *“Recommended Energy Conservation Measures”* – Recommended ECMs are described in this section, including descriptions of the current equipment, the proposed changes, and the impact to the facility environment.

5. *“Final Engineering Procurement & Construction”* – In this section a management plan, final engineering and design is provided. Additionally, coordination with subcontractors and a proposed schedule for implementation are located here. Project safety is also covered in this section.

6. *“Projects for Future Consideration”* – Listed are those projects that at the current time, for either technical or cost considerations, were not included in the recommended ECMs.

7. “*Unviable ECMs”* – Listed are those ECMs that were reviewed but are not feasible due mostly to length of payback term.

8. *“Incentives and Rebates”* – Identification of available sources of rebates and other incentives.

9. *“Financial Analysis”* – This section includes a cash flow analysis of the entire recommended program as well as how financing of the project was sourced.

Step Three – Financial Development

The key feature common to energy performance contracting projects is that the project is financially and operationally justified over the term of the contract. This requirement can include that the building owner's debt-service payments equal the annual cost-avoided energy and operational savings over that life of the project. This financial payback model can include a reasonable annual rate of utility escalation. In order to meet the financial and payback requirements mandated by the Customer, the ESCO assumes the performance risks associated with developing, financing, implementing and operating the project. This means that the ESCO 1) invests its own resources to develop the project, 2) provides or arranges the necessary construction financing, 3) provides or arranges long-term financing so that the annual repayment obligation is less than the project's construction costs exceed the GMAX price, or the cost-avoided saving do not meet the guaranteed amount.

There are numerous financing sources available to finance energy performance contracts. Most ESCOs offer to assist in arranging financing for the project. While the debt obligation resides with the Customer, the ESCO provides a guarantee for the project's financial, operational and life-cycle performance. The performance and cost-avoided savings guarantee from the ESCO is often viewed as a benefit by the lender since the guarantee makes the ESCO financially liable for any shortfall that could occur in the achievement of cost-avoided savings needed to cover the debt service. If the guaranteed level of savings does not materialize, the ESCO is contractually bound to compensate the building owner for the difference between the actual and guaranteed savings on an annual basis. Savings are based on units of energy not dollar amounts.

Since public agencies are generally tax-exempt, it makes economic sense to use some method of tax-exempt financing. Most ESCOs will offer to assist in the arrangement of tax-exempt project financing and many have established relationships with financial institutions willing to provide financing for these projects. While it is the Customer's obligation to repay the financing, the ESCO is required to provide a cost-avoided savings and performance guarantee that includes a guaranteed maximum project implementation cost.

Tax-exempt municipal lease-purchase of General Obligation Bonds are the most common methods used by public agencies to finance energy savings projects for the following reasons:

- The financed project is fully amortized over the financing term with an amortized payment schedule.
- The full cost of the project can be financed including design and engineering fees, equipment installation, and commissioning.
- Lease payments are considered a current expense subject to appropriation (non-appropriations clauses are standard contract provisions). This allows Idaho public institutions to use tax-exempt municipal leases to fund ESPC projects.

- Leases do not require voter approval since they are authorized in enabling legislation.

Master leases are used in instances where the building owner wishes to implement a number of projects at various times and locations. A master lease uses schedules to add multiple projects of varying values and terms over an extended period of time. Certificates of Participation (COPs) are similar in that they provide funding for groups of projects. Under this structure, “certificates” are sold to investors who share in the revenue generated from the lease payments made by the customer. While COPs have a higher cost of issuance than tax-exempt leases, their interest rates are generally lower.

State and local government agencies like public school districts also have the option of financing projects by issuing General Obligation (GO) bonds. GO bonds require voter approval. However, financing costs are usually lower than leases and allow for an agency to expand the scope of a project to include other necessary facility upgrades and improvements using a coordinated procurement process. Institutions can elect to transfer cost-avoided utility savings to help pay for the debt service, thereby reducing the impact to taxpayers. While bonds offer the lowest interest rates, there are statutory debt restrictions that can limit their availability. However, because most Idaho institutions carry little long-term debt, bond capacity is almost always more than is required to fund a project. Additionally, there are large issuance fees and underwriting expenses associated with issuing bonds and they must be approved by the voting public before being issued. Therefore, projects that are less than $5 million in size typically make poor candidates for financing through bonds. [3]

Financing projects is a complicated process, and Customers are advised to obtain and follow competent legal advice throughout the energy performance contracting process and particularly in development and execution of the financial plan.

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[3]Taken from the Energy Performance Contracting Guidebook, P. Donahue, Donahue and Associates, for NAESCO, U.S. DOE and Rebuild America 2001.

Scope Selection and Contract Development

Step Four – Scope Selection and Contracts

Scope Selection - Typical process

The typical scope selection process is dependent upon the agency's needs, goals and wish list items with respect to financial, term and statute requirements. The goal is to structure a program that contains the right mix of short payback items and longer payback items that when combined have an acceptable payback term and to ensures that the program can be funded from the energy savings. The scope should reflect only those measures with which the agency or public entity is comfortable in pursuing.

Contract Development

Performance contracts usually involve capital equipment essential to the facility's mission and can easily involve total investments in the millions. The contract establishes a long-term relationship between the facility and contractor, and agencies should develop terms to address potential issues with great care. The ultimate goal of the contracting process is to reach an agreement, which is equitable to both parties, protects the interests of the facility, and is so clear that any third parties reading it will interpret it the same way. Below are key issues to address in a performance contract.

1. Select the type of Energy Performance Contract. Energy performance contracting for public facilities, lists options including "leasing, joint ventures, shared savings plans, or energy service contracts" as possible types of performance contracts. The preferred form of contracting for State-owned facilities is the contract for services with a guaranteed cost-avoided energy and "hard-dollar" operational savings provision. The services provided under the contract may be for financing, design, installation, repair, maintenance, management, technical advice and/or training. In this type of arrangement, the ESCO guarantees that energy costs, plus all costs of ECM's and/or services provided, will be financially justified over the life-cycle performance of the systems. If the guaranteed level of cost-avoided energy savings as measured in units of energy is not met, then the ESCO pays the Customer the difference typically reconciling on an annual basis. Shared savings' agreements are becoming rarer in the marketplace these days. These agreements call for payment to an ESCO being made from a predetermined percentage of energy cost savings. This type of contract presents difficulty in that it may incent an ISCO to underestimate and guarantee the energy savings so that surplus savings occur.

2. Include any terms required by statute. For Idaho this may include: Public Entity means the cities, counties, higher education, public hospitals, and school districts or any political subdivision within the State of Idaho. In 2004, the Idaho ESPC enabling legislation was amended to clearly include cities, counties, and K-12 schools.

3. ESCO Services. As in any contract, the scope of work that the contractor is responsible to complete must be described clearly and completely. In a performance contract, the contractor may be performing services in several different areas. Common services include:

a. A detailed energy study to identify existing conditions and propose improvements;
b. Engineering and design services;
c. Construction services (including any licenses and permits required);
d. Commissioning and retro-commissioning;
e. Operations and maintenance services (including preventive maintenance, repairs, and emergency service);
f. Training services (to ensure facility staff can operate equipment); and
g. Ongoing monitoring, measurement and verification (performance assurance).

Ordinarily, the contractor is responsible for all equipment repair and scheduled maintenance. In some cases using on-site Customer personnel to perform some maintenance may reduce costs. Usually the on-site personnel retain most operating responsibilities.

4. Customer Responsibilities. Generally, the efficiency improvements installed by the contractor depend on certain actions by the Customer in order to achieve savings. The Customer must make sure that the contract describes its obligations very clearly. This ensures that the Customer understands its commitment and prevents the contractor from unreasonably claiming that savings were not achieved due to omissions by the facility. Customer responsibilities may include operating or maintaining existing equipment in a way that helps the contractor's improvements to achieve savings. For example, if the contractor proposes energy management controls for an existing air conditioning system, the contractor may ask the Customer to maintain the system to an agreed standard.

5. Compensation. The contract must establish what price will be paid for the contractor's services, the timing of payments, and how payments will be calculated. This is more complicated in a performance contract because the contract is awarded before the improvements are known and a total price can be determined. To allow for this, the contractor submits a pro forma and schedule of values in the proposal, which establishes the price based on the project scope. The Comprehensive Energy Audit report includes a calculation of the final price, payment schedule, and termination value, based on the approved project scope and this price formula.

6. Term. The contract must state the term of the agreement and under what circumstances it may be terminated. Possible reasons for early termination include failure to agree on the content of the Energy Study Report (including what measures to install or the total price), failure to appropriate sufficient funds for the continuation of the contract, or default.

7. Ownership of Equipment. The contract should make clear who owns the equipment installed by the contractor at all times during the contract. Equipment

ownership may be important to the contractor for purposes of securing financing or for the tax treatment of the contractor's revenues under the contract.

8. Standards of Service and Comfort. One inappropriate way a contractor could increase savings might be to reduce the amount of cooling or lighting below the levels customarily provided in the facility. In order to prevent this, the contract must establish what levels of cooling and lighting are considered acceptable and require the contractor to design, install, and maintain equipment to provide these levels. Contract language should address standards of service and comfort, including space temperature, humidity, outside air ventilation, and light levels. Facilities should carefully consider any special service standards (e.g. computer rooms, laboratories) and ensure that they are included in general or special provisions.

9. Savings Measurement. In a performance contract, savings measurement is a vital issue. Generally, the improvements to be installed must be known before the most appropriate savings measurement method can be selected. Therefore, the contract requires the contractor to provide a detailed savings measurement plan, including the method for establishing the energy baseline, in the energy and financial audit. Customers should scrutinize the measurement plan with great care before accepting the audit for incorporation into the contract. It is becoming more common that agencies whish to measure their reduction in carbon "footprint". This can be incorporated as part of the overall measurement and verification plan.

Material Changes and Baseline Modifications

An issue related to savings measurement is what to do if the operation or equipment of the facility changes and making the original energy baseline unrepresentative of the actual operation. Generally, contracts provide that when the facility changes in a way that affects the project energy savings significantly, the baseline will be modified to reflect these changes.

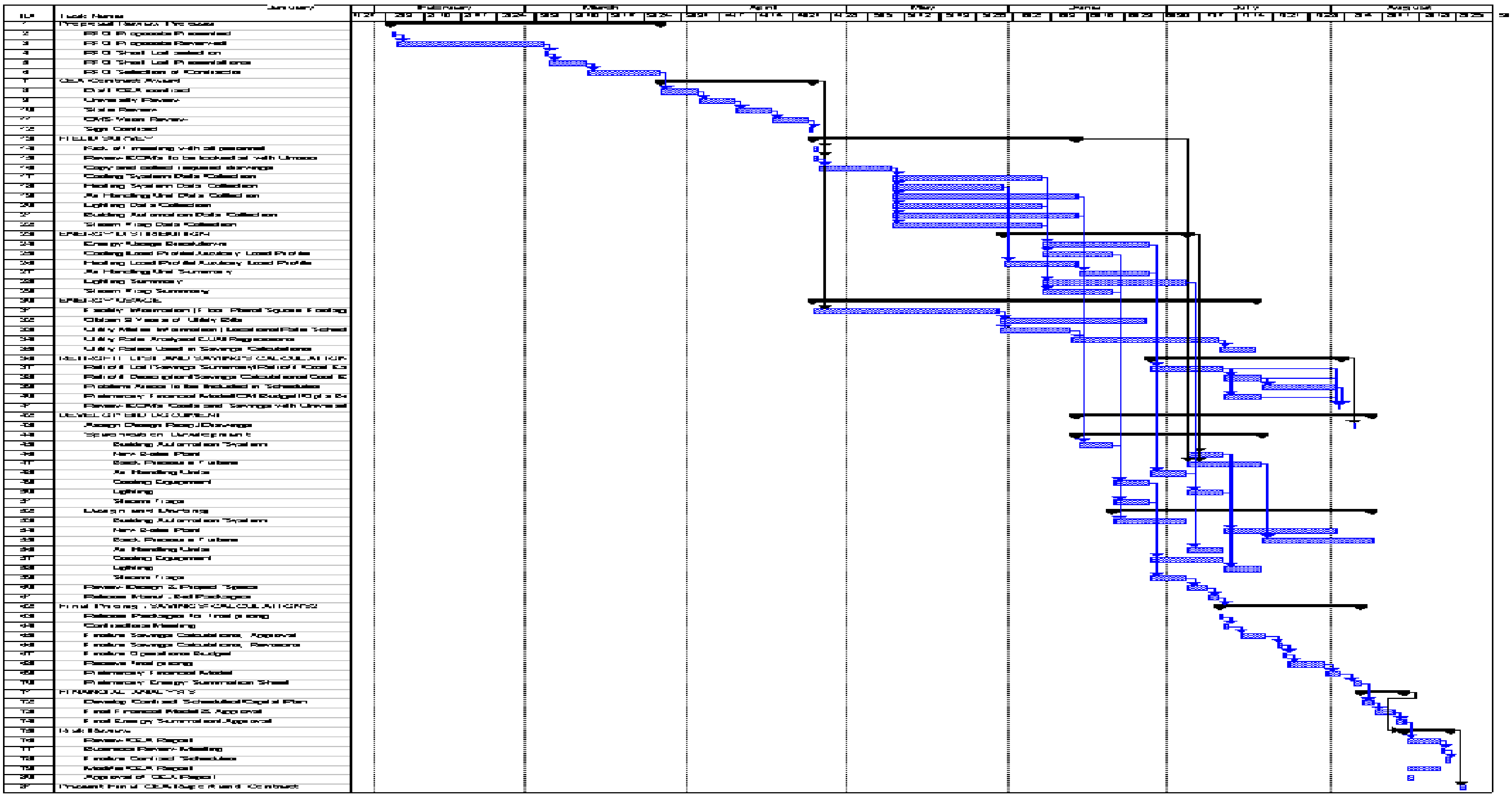
Step Five – Implementation

Implementation/Construction

A critical element of planning is to establish a master project schedule and various sub-schedules for subcontractors, equipment and material. The project schedule should be prepared in collaboration with Customer and ESCO Construction Managers. One common tracking tool used by ESCOs and other engineering and architectural firms to produce the master project schedule is Microsoft Project. MS Project produces a schedule on both Gantt and Pert charts. These charts present a visual representation in a time-scale for project tasks.

The master schedule outlines project activities from the design phase through construction and commissioning (listed in calendar days). Start dates are shown for all subcontractors-work and defines a workflow-time and its dependence on key material and equipment delivery dates. Project workflow is coordinated with the Customer to assure maximum production with minimum disruption to staff, and building systems and services. The ESCO Project Manager coordinates schedule changes with designated staff and the Construction Manager and updates it daily. Construction progress is compared to the plan and slippage requires a corrective action report. On the next page is a sample of the types of milestones and schedule items that should be tracked for implementation.

Figure 1-4 Gantt Chart for EPC Construction/Implementation



Step Six – Measurement and Verification

To ensure persistent energy savings and reliable equipment performance an energy savings project should include savings measurement and verification and project commissioning.

Measurement and Verification (M&V)

Savings measurement and verification is a procedure to document and confirm that the estimated or guaranteed savings are being produced by the new equipment, systems or operational changes implemented as a part of the EPC project. The appropriate methods of M&V depend on what equipment or measures have been installed. It can include one-time end use measurements, engineering calculations, sub-metering, utility bill analyses, computer simulation, or other methods to ensure that the savings performance of the installed project persists for the duration of the contract. Low cost submetering equipment is now available. Contact the Office of Energy Resources for more information.

Energy and operating savings are calculated by comparing consumption and costs before (the base year) and after the project is installed. The base year provides the foundation for the analysis of savings from the installation of the new energy equipment. The base year can be affected by:

- Changes in building equipment, schedule, occupancy, or controls
- Changes in operations or maintenance procedures
- Unusually mild or severe weather
- Changes in utility costs
- Existing service levels for lighting, ventilation, temperature, and humidity
- Equipment sizes, loads, and operating conditions

The International Performance Measurement and Verification Protocol (IPMVP) was developed by the U.S. Department of Energy in cooperation with many nationally recognized technical advisors and experts and is considered to be the industry standard for providing technical guidance in the selection of appropriate M&V strategies for EPC projects. An electronic copy of the IPMVP can be downloaded from the internet at http://www.ipmvp.org.

The agency should know that ongoing monitoring and verification in an EPC does increase project cost. Typically, if a customer is achieving the savings over the first few years they may opt to terminate the ongoing M&V portion of the contract or consider taking it on themselves.

Project Commissioning

Project commissioning is can be a smart investment which may also reduce energy and other building operating costs by as much as 5 -10 percent. Commissioning is essentially a systematic performance testing process that verifies the new equipment and systems operate as intended. Commissioning procedures should document system design, installation, and the operations and maintenance requirements of the project and usually range in cost from 1 percent to 4 percent of the construction budget, depending upon the technical scope of the project. Commissioning can provide better planning, coordination, and communication between the ESCO and the building owner which can result in fewer change orders and call backs, shorter punch lists, and a faster and smoother equipment startup process. Retro-commissioning of existing facilities can also be financially beneficial—even in newly constructed buildings, since most construction projects do not include commissioning and, therefore; lack optimum performance and energy efficiency.

Current Financial Options

There are several ways of financing energy conservation projects. Cost, speed, simplicity and prepayment requirements are the individual components that need to be considered in determining the best financial solution for a specific project. A good understanding of the agency's needs and goals is necessary to properly weight these criteria so that the optimum financing is obtained. For example, if there are serious infrastructure problems and the desire is to fund the most comprehensive program possible, then the cost of money becomes the most important factor (i.e., the lower the rate, the farther the energy savings will stretch thus allowing the maximum amount of work to be done). On the other hand, if the project is focused on replacing a chiller or boiler within 12 weeks due to the approach of a season change, then the speed with which the financing can be put in place becomes the most important factor with prepayment options coming second. There are a number of federal, state and local utility incentives, financing subsidies, grants, tax-credits, etc., all of which can assist in the financial engineering of a project.

Below are the primary financing vehicles:

1. Use proceeds from a Bond issue - Lowest rates. Highest fees. Good for large, long term projects ($5,000,000 or more for 15 or more years).

2. Tax-Exempt Municipal Lease (comparable rates, lower fees as compared to bonds)
   - Capital Lease (subject to annual appropriations, on balance sheet)
   - Operating Lease (off balance sheet, absolute obligation)

3. Customer arranges own financing - Master Lease or banking relationship is already in place. This offers speed and simplicity

4. Energy Services Contract - Typically not a good solution for tax-exempts. The ESCO underwrites the financing, which is done at taxable rates, and then discounts the payments to a bank or other financial institution at no markup. This method can be a good solution for a Non-Profit if a conduit cannot be arranged.

What does *Guarantee* mean?

If a project is based on a guarantee of energy savings, the ESCO guarantees that a specified average level of energy units and "hard-dollar" operational cost savings, or both, will be realized by the customer – ideally equal to project costs and debt service payments for the project – over a set period (typically equal to the term of project financing). This payback schedule may include a calculation for annual escalation of energy/utility rates. This can range from 3 – 10% depending on the region of the country and historical trends as calculated over the past 10 years. Five percent is the most common average. This amount must be a conservative figure as measured against realized rates of energy cost escalation. Including escalation in the payback models provides a more realistic view of long-term cost-avoided energy savings.

The customer pays the ESCO on the basis of an agreed-upon payment schedule, while the ESCO agrees to reimburse the customer for any shortfall in cost-avoided energy savings (measured in units of energy) at the end of the set period. The customer may be asked to agree to share with the ESCO any excess savings beyond that amount guaranteed (shared savings). However, as a rule "shared-savings" contracts are typically discouraged with public institutions.

The guarantee is a very important part of any energy performance contract project. The customer must do their due diligence when selecting an ESCO to partner with for a project that can span 10 - 20 years in length. Investigate the ESCOs references, case studies, financial strength and professional associations and accreditations. In addition, the ESCO's willingness to declare costs, markups, and pricing methodology is also critical.

The ESCO or contractor should also provide an assurance that an open-book pricing methodology will be employed. A cost-plus, fixed fee to a guaranteed maximum project cost is ideal. Ideally, the project will be implemented for less than the GMAX cost. In this case any surplus construction savings should always be returned to the Customer.

What are Operations and Maintenance Savings?

Operational and Maintenance savings can be achieved when implementing an energy performance contract. For example, if a comprehensive lighting retrofit were to take place ballast and bulb replacement will be reduced due to the fact that the equipment installed has a longer life than the equipment it was replacing. For instance, the typical burn hours for an incandescent lamp are 750 to 2000 hours. The typical burn hours for a compact fluorescent lamp are 10,000 hours. An ESCO could determine the maintenance savings dollars based on the actual lamp and ballast costs during the comprehensive energy audit.

Another source of “hard-dollar” operational savings occurs when an institution no longer has to pay to have outside service for aging equipment that is replaced by new, warranted, and better performing systems.

In addition to the maintenance savings, “hard-dollar” operational savings can be gained as well through implementing an ESPC. Equipment modifications and automation may save manpower costs due to the fact that the new equipment may require less operations oversight. Performance contracting can free the staff to do other work that has been put off far too long.

What Kinds of Equipment and Services Can Be Purchased?

Energy-savings performance contracts are used to purchase a wide variety of building equipment and services. Energy-efficient lighting, air-conditioning systems, energy management control systems, motor replacements, and variable-speed drives for pumps and fans are commonly implemented improvements. Generally, a performance contractor will include any improvement expected to recover its own cost (including maintenance and interest expense) in energy savings over the term of the agreement. This means that longer payback items, such as adding ceiling insulation or replacing windows, usually do not qualify unless they are bundled with fast payback items.

Some potential ECMS are shown in the following:

Figure 1-2 ECM Table

	**Sample Energy Conservation Measures (ECMs)**
SAMPLE ECM	***DESCRIPTION***
BUILDING ENVELOPE	
Attic Insulation	Install batt insulation in attic space or blow in rock wool insulation to reduce the heat lost through ceilings and roofs.
Double Pane Windows	Replace existing single-pane windows with double-pane windows.
Floor Insulation	When building floors are cold because of unheated space below the floors, consideration should be given to installing foam or fiberglass batt insulation between the floor joists to improve comfort and save energy.
Install Insulated Overhead Doors	Existing overhead doors are constructed with low resistance to heat transfer. Replacing these doors with insulated overhead doors will increase the thermal resistance and reduce the heat lost from the building.
Insulated Window Panels	When buildings have large expanses of single-pane windows, many of these windows could be replaced with insulated panels, which would greatly reduce the heat lost through these windows. Some window areas would be left in each room to provide a reasonable quantity of outside light and allow windows to be opened for ventilation.
Roof Insulation	Installing additional roof insulation at the time building roof membranes are replaced will reduce heat loss or heat gain through the roof.
Storm Windows	Adding storm windows over single-pane windows or replacing the windows with double-pane windows would save substantial quantities of energy. These measures are costly, and simple payback time is usually long.
Weather-stripping	Weather-stripping on walk-in and overhead doors degrades with use leaving cracks that will allow cold outside air to infiltrate into the building during the heating season. This outside air must be heated to room temperature. Reducing the quantity of infiltrating air by installing or replacing degraded weather-stripping will save heating energy. Weather-stripping will also save cooling energy, but the magnitude for the saving is normally much smaller than for heating.
Window Film	Large expanses of glass on the east or west side of a building can impose a large cooling load on rooms or areas with an east or west outside wall. This load often causes these areas to overheat or result in setting the electrical demand for the facility. Films have been developed that can be installed on the inside surface of windows to block most of the radiant heat from entering the building. These films should not be installed on double-pane windows because they may cause one of the panes to crack. The greatest benefit of the films is comfort, but their use can also reduce the cooling demand and cooling energy.

LIGHTING	
Automatic Lighting Controls	Many buildings have areas where light usage is sporadic, yet lights are often left on after everyone leaves; e.g., lounges, restrooms, receiving platforms. Motion control devices, or "People Sensors," can be installed to remedy this situation and save energy.
Ballast Savings	In many cases, four-lamp, troffer-type fluorescent fixtures have two tubes removed to save energy. Disconnecting the ballast that powers the removed tubes can save additional energy.
Exit Light LED Retrofit	Exit lighting fixtures that use incandescent lamps should be converted to use LED lamp strips. Since these fixtures operate for 24 hours per day, savings and payback times are favorable. This change will also reduce maintenance.
Exit Light Fluorescent Retrofit Kit	A fluorescent light kit can be installed in some incandescent exit lights to convert them to a lower-wattage fixture. This change would reduce energy consumption as well as maintenance.
Fluorescent to Low-Wattage Fluorescent	Some areas utilize 40-watt (four-foot) and 75-watt (eight-foot) fluorescent lamps, and, in many cases, these areas are over-lit. The fixtures should be retrofitted with lower-wattage lamps. The slightly higher cost of these lamps will more than be offset by reduced electricity costs during the life of the lamps.
Fused Quartz to High Pressure Sodium (HPS)	Some areas utilize 40-watt (four-foot) and 75-watt (eight-foot) fluorescent lamps, and, in many cases, these areas are over-lit. The fixtures should be retrofitted with lower-wattage lamps. The slightly higher cost of these lamps will more than be offset by reduced electricity costs during the life of the lamps.
Incandescent to Metal Halide (MH)	High-wattage incandescent fixtures can be replaced with lower-wattage MH fixtures for the same or increased light.
Incandescent to Fluorescent	Many incandescent light fixtures can be replaced with fluorescent fixtures that would use less watts to obtain equal or better lighting output.
Incandescent to Fluorescent or MH	Incandescent lighting can be replaced with more efficient fluorescent or MH systems. Retrofitting existing fixtures is the most cost-effective method for this replacement. However, some situations require installation of new fixtures in order to provide standard levels of lighting intensity. Coloring required of the lighting and the environment of the fixture will also determine the type of lighting and conversion to use.
Incandescent/Mercury Vapor to HPS	Some exterior lighting fixtures utilize incandescent or mercury vapor lamps. These fixtures can be renovated or replaced with HPS fixtures. Lighting levels should be evaluated to ensure that energy is not wasted by being over-lit.
Incandescent to HPS	High-wattage incandescent fixtures can be replaced with lower-wattage HPS fixtures for the same or increased light.
Install Specular Reflectors	Specular reflectors can be installed in fluorescent light fixtures to improve the efficiency of the fixture. The reflector will allow half of the fluorescent tubes to be removed with little or no reduction in lighting output.
Install T-8 Fluorescent Lamps & Electronic Ballasts	A T-8 fluorescent lamp gives a higher lumen output than standard fluorescent lamps. Replacing the existing lamp and ballast systems in areas with marginal light levels with T-8 lamps and high-frequently ballast systems can improve the light level and require less energy.
Mercury Vapor to HPS Lights	Mercury vapor lights are relatively inefficient and lighting output decays with time. These fixtures can be retrofitted with an HPS kit or the entire fixture can be replaced. Such changes greatly improve lighting efficiency.
Install T-8 Fluorescent Lamps & Power-Reducing Electronic Ballasts	When lighting intensities from fixtures containing T-12 lamps and magnetic ballasts are above the minimum recommended level, the fixtures can be retrofitted with T-8 fluorescent lamps and power-reducing electronic ballasts.
Install T-8 Fluorescent Lamps & Tandem Wired Electronic Ballasts	When fixtures are mounted end-to-end or located close to each other, a ballast may be installed in one fixture and wired to drive an adjacent fixture.
Photocell Control of Lights	Some buildings have large expanses of glass, which allow daylight to provide more than enough light for daytime activities. A photocell control can be installed in the lighting circuit that will turn off the lights whenever the daylight provides adequate light.
Replace Incandescent Ball Lights with Fluorescent Ball Lights	Many times, a large number of incandescent ball bulbs are found in lobby or hallway areas. This measure would replace these inefficient units with PL-type ball lights on a one-to-one basis.
Retrofit Can Fixtures with PL Fluorescent Lamps	Lower-wattage, PL-type fluorescent retrofit lamps can be installed in incandescent can (or recessed) fixtures, which will greatly improve the efficiency of the can fixtures. There will be no change in lighting intensity and energy will be saved.
Install Room or Zone Light Switches	Lighting in many buildings is switched on and off at a central lighting switch panel. Installing lighting switches in a room or zone will allow occupants of a room or zone to turn off lights when they are not needed, and when the area is vacated.
Schedule Outside Lights	Outside building and parking lot lights are often left on after everyone has left the premises, as a means to deter vandalism and thievery. Experience has shown that the opposite is true; i.e., that vandalism and thievery actually go down when an area is blacked out. Accordingly, all outside lights should be scheduled off after everyone has left the premises.

ENERGY MANAGEMENT CONTROLS	
365-Day Electron Time Clock	HVAC equipment can be turned off and temperatures set back at night and on weekends through the use of seven-day mechanical time clocks. By installing 365-day electronic time clocks, or a simple energy management system, this automatic scheduling of equipment and temperature setback can be extended to include other unoccupied times such as holidays.
Domestic Hot Water Pump Timer	Most domestic hot water circulating pumps run continuously to provide hot water as soon as a tap is turned on. The pump runs numerous hours while the building is unoccupied. Installation of a timer to schedule hot water pump running time will save electrical energy.
Expand Energy Management System	Energy management systems can be expanded to control additional energy-consuming equipment and, thus, further reduce energy consumption.
Install Energy Management System	The installation of an EMS at buildings using time clocks will facilitate scheduling equipment off and on, and setting heating temperatures back during unoccupied times. Turning off equipment within a building or building areas when not needed saves energy costs.
Add Control to Cooling Coil	A cooling coil on multi-zone air handlers can run wild. This lack of control leads to poor room temperature control and a waste of cooling energy. Installing a control valve to handle cold deck temperature and using worst-zone reset will improve comfort in areas served by the air handler and save energy.
Control Outside Air to Meet Needs	In some areas, more outside air is delivered to spaces than required by code for ventilation. Controls could be applied to minimize the quality of outside air to avoid heating larger quantities of outside air then required.
Schedule Exhaust Fans	Exhaust fans in many buildings are operated longer than required. Since they draw conditioned air out of a building, which has to be replaced with outside air, reduced operation will save thermal and electrical energy.
Set Back Nighttime Temperatures	Building heating temperatures might not be set back at all, or they may be mildly setback at nighttime. This measure would add controls to allow nighttime heating temperatures to be set back deep.
Turn Off Return Air Fans	Return air fans on some systems can be turned off with little or no change in the performance of the air handler system. This measure would try turning off return air fans to determine which fans do not need to be operated. Electrical energy is saved and electrical demand is reduced when the fans are switched off.
Worst-Zone Reset	During the heating season, the cold duct on dual-duct systems and the cold deck on multi-zone systems are normally controlled to a fixed temperature between 55– 65 degrees F, even though a temperature this low may not be needed. The cold duct or cold deck temperature for selected air handlers should reset to the highest temperature possible to allow more return and less outside air to be used. This control method will minimize hot and cold air mixing penalties for dual-duct and multi-zone air handlers.
Replace Energy Existing Management System	If an energy management system is present, replacing it with a “newer generation” system might add new abilities and ease of operation for heating, cooling, and some lighting systems.
Setback Perimeter Radiation	Many times, air handlers are scheduled by an energy management system, but the system is not connected to control the perimeter radiation. Consequently, the perimeter radiation system that makes up part of the building shell losses will have little or no temperature setback during unoccupied times or during nighttime. Connecting the perimeter radiation to the energy management system will allow energy to be saved through temperature setback during unoccupied times.
Smart Thermostats	Thermostats can now be obtained that can be programmed to set heating temperatures back during unoccupied times and optimally start in the morning. This type of thermostat should be considered for small buildings.
Direct Digital Controls	Replace existing controls on HVAC equipment with direct digital controls and integrate with an energy management system. NOTE: This replacement is expensive, but is of interest to clients when they do not have the skills needed to maintain and use existing control systems such as pneumatic controls.
CO_2 Control to Minimize Outside Air Quantities	Many areas in buildings have a varying ventilation need because occupancy varies over time. A CO_2 sensor can be integrated into controls to vary the intake of outside air through outside air damper control, based on the level of CO_2 in the return air stream. Reducing the quantity of outside air requiring heating or cooling will save energy.
Scheduling Return Fans Separately from Supply Fans	Most fan systems equipped with both supply and return fans will electrically interlock the two units, so that the return fan is energized when the supply fan is turned on. Return fans often can be turned off with little or no effect on the environmental control of the space served by the fan system.

HVAC EQUIPMENT UPGRADES AND/OR REPLACEMENT	
HVAC COOLING	
Absorption to Centrifugal Chiller	Old steam absorption chillers are much less efficient than centrifugal chillers. This measure would consider replacing absorption chillers with more efficient centrifugal chillers.
Add Heating/Ventilating Roof-Top Unit	Sometimes, a large area in one building is conditioned during unoccupied hours because a small area in the large zone served by an air handler requires continuous occupied temperature control. The installation of a small roof-top unit would allow the temperature to be set back in most of the area served by the large air handler during unoccupied times and thus save energy during unoccupied times. Thermal and electrical energy would be saved.
Chiller Optimizer Control	Chiller optimizer control addresses delivering chilled water at the highest practical temperature and using the lowest acceptable cooling tower water temperature consistent with cooling tower capabilities and chiller limitations. The efficiency of a chiller increases about 1 percent per degree F that chilled water temperature is increased and 1percent per degree F that cooling tower water is decreased.
Install Variable Speed Drives on Cooling Tower Fans	Cooling towers are designed to provide cooling water at severe design weather conditions such as 95 degrees F and 75 percent relative humidity. At less severe weather conditions, the cooling tower is over-designed and can produce adequate cooled water with less-than-designed fan CFM. A two-speed motor can be used as an alternative to the variable-speed drive. This measure will save fan energy.
Variable Pumping of Chilled Water	Usually, chilled water is pumped to air handler coils as though conditions required full flow. At times, much of this water is bypassed to the return water line. Installing variable-speed drives on pumps and two-way control valves at chilled water usage points would permit less water to be pumped, thus saving pumping energy.
Ice Storage	Ice storage can be used to lower on-peak demand and energy charges by using electrical power during off-peak times to freeze ice. This ice would then be used as a cooling source during on-peak times to avoid operating electrically driven mechanical cooling equipment.
Schedule Use of Crankcase Heaters	A multi-compressor chiller contains electric resistance crankcase heaters on each compressor. These heaters run continuously. Since the compressors are located inside, and the crankcase heaters are not needed until two or three days before the chiller is to be used, these crankcase heaters could be turned off during most of the chiller idle time and thus save electrical energy.
Replace CFC Using Chillers with Non-CFC Units	Most existing chillers produced before 1990 use CFC refrigerants, which are known to damage the ozone layer when the refrigerant leaks or is vented to the atmosphere. Since production of CFC refrigerants was halted in 1995, the cost of CFC refrigerant has increased dramatically, detailed records are required, and high fines are imposed by the EPA when CFCs are lost to the atmosphere. Forward-looking organizations are taking steps to install new energy-efficient chillers that do not use CFCs. Chillers less than 10 years old may be candidates for retrofitting to use non-CFCs. Electric and maintenance savings offset part of the required investment, and the potential liability associated with CFC leakage is avoided.
Evaporative Cooling	This form of cooling can be used in areas where the relative humidity is low. Air is cooled by evaporative water in the air stream. The water evaporation raises the air stream humidity. Single- and two-stage units are available. In the first stage of a two-stage unit, evaporating water cools one side of the heat exchanger, which in turn cools air blown over the other side of the heat exchanger. Water is added to the cooled low-humidity air in the second stage, which further cools the air. Single-stage units do not use the first stage of a two-stage unit.
Free Cooling with Cooling Tower	Some buildings are constructed with minimum outside air capability. Interior spaces require cooling throughout the year. Outside air can be used to cool the interior spaces during the heating season, but the limited quantity of outside air may not satisfy cooling needs. Consequently, it is necessary to run mechanical refrigeration for cooling during the heating season. Cooling towers can be operated to generate the chilled water during the heating season instead of using-mechanical generated cooling. A plate and frame heat exchanger is used between the cooling tower and chilled water piping to avoid contaminating the chilled water loop with cooling tower water. This arrangement is often referred to as a hydronic economizer.
Direct-Fired Absorption Chillers	Direct-fired absorption chillers can be used to replace electrically driven chillers that use CFC refrigerants. These direct-fired units can serve as a chiller and boiler, & use environmentally friendly water as the refrigerant. These units cost about twice that of a centrifugal chiller and require a larger cooling tower. Since the energy is natural gas, the energy cost is expected to be about one-third the cost of electrical energy on a BTU basis. However, the coefficient of performance (BTU out/BTU in) is lower. This ECM warrants consideration when electrical demand is high.

Natural Gas Engine Driven Chiller	Chiller units have been developed that use natural gas-fueled internal combustion engines to drive centrifugal chiller compressors. These units cost significantly more than electrically driven chillers, but use a lower-cost energy source, and have a lower coefficient of performance (fuel BTU in/cooling BTU out). This ECM warrants consideration where electrical demand costs are high.
Cooling Tower Free Cooling	Cooling towers can be used to provide free cooling during the heating season. A plate-and-frame heat exchanger should be installed between the tower water and chilled water circuits to avoid contaminating the chilled water. The cooling tower will save energy by turning off chillers that operate during the heating season.
Reduce Outside Air for Dual Duct System	Cold duct temperatures for dual-duct systems that serve interior spaces normally use outside air to obtain the cold duct set point temperatures by mixing outside air and return air. All hot duct air must be heated from the cold duct to the hot duct temperature. Free cooling from a cooling tower can be used to provide the cold duct setpoint temperature. This arrangement allows the outside air to be reduced to that required ventilation. Energy is saved because less heat is used for hot duct temperature control.
Reduce Outside Air for Multi-zone Systems	Cold deck temperatures for multi-zone systems that serve interior spaces normally use outside air to obtain the cold duct set point temperatures my mixing outside air and return air. All hot deck air must be heated from the cold deck temperature to the hot deck temperature. Free cooling from a cooling tower can be used to provide the cold deck temperature. This arrangement allows outside air to be reduced to that required for ventilation. Energy is saved because less heat is used for hot-deck temperature control.
Replace Old Centrifugal Chiller with High-Efficiency Centrifugal Chiller	Chillers are now made that require about half the electrical energy as their old counterparts. In addition, these new chillers do not use CFC refrigerants. This ECM saves cooling energy costs and removes CFCs from the premises.
Spot Cooling	Some facilities need to run cooling equipment during times of very low occupancy because the current systems have to address the entire facility or a large area. For example, an entire facility is cooled during the night and weekends when only the security office is occupied. The installation of a dedicated spot-cooling unit would allow large cooling systems to be turned off during times of low occupancy.
Schedule Chillers on a Chilled Water Loop for Least-Cost Operation	Some chilled water loops use a number of chillers in a central plant or attached to the loop at various points. These chillers will normally have varying operating efficiencies. Chillers should be turned on based on the lowest operating cost units first and progress toward chillers with the highest operating cost. Chiller operation should be turned off in the reverse order.
HVAC AIR SIDE	
Convert Dual Duct to Variable Air Volume (VAV) System	Some buildings might have a dual-duct system; in which heated and cooled air is mixed to provide the proper supply air temperature for heating or cooling a space. This system is wasteful, since a constant volume of air that has been heated and air that has been cooled are mixed to provide an intermediate temperature, and essentially, the air is being reheated and re-cooled. This system can be converted to VAV, in which air is heated or cooled to one temperature, and the amount of air to each space is varied to satisfy that zone. This conversion results in both fuel savings and fan savings.
Convert Reheat Air Handler Systems to VAV System	In reheat systems, air is cooled to a low temperature and then reheated to a temperature needed to control a room temperature. As the first step in controlling space temperatures, much of this reheating could be avoided by installing a VAV box in series with the reheat coil to vary the quantity of air to the space. Reheat coils would be activated if the VAV box could not manage control. This measure will save both heat energy and fan energy.
Install Local Override on Air Handlers	When some air handlers are operated on a longer schedule than actually needed to accommodate a varied use, unneeded operation can be reduced with a local override. This override would allow them to turn the air handlers on for a selectable time (1 to 3 hours). Thermal and electrical energy would be saved.
Modify 100% Outside Air Handlers for Return Air	Areas served by some 100 percent outside air handlers do not require 100 percent outside air. Consequently, these units can be modified with a return air path or duct and greatly reduce the amount of outside air that has to be heated to room temperature.
Reactive Economizers	Many times, air handlers are equipped with outside air economizers to cool with outside air when practical. When the economizers are inoperable or not used, mechanical or absorption cooling is required to control space temperature. This measure concerns reactivating the economizer controls to avoid operating mechanical or absorption equipment when outside air temperatures are suitable for providing cooling.
Two-Speed Motors	Air delivered by multi-zone heating and cooling air handlers is set by cooling requirements. Less air is required for the heating mode of operation. Therefore, the original motor can be replaced by a two-speed motor, which will facilitate operation at a lower speed during the heating season. This low operating speed will save electrical energy and also lower heating costs by reducing damper leakage.

Install Damper to Isolate Unoccupied Areas	When an air handler system serves areas that are occupied during a normal work day and other areas occupied much longer than the normal work day, dampers can be installed in ducts to isolate the areas occupied the least amount of time. The dampered space can be controlled to obtain a temperature setback saving, ventilation savings, and fan energy savings.
HVAC WATER SIDE	
Optimize Building Heating Pump Operation	Many times, building heating pumps run continuously during the heating season. This measure would cycle the pumps during unoccupied times at outside air temperatures greater than 40 degrees F to maintain the setback temperatures. At temperatures below 40 degrees F, the pumps would run continuously. Electrical energy would be saved.
Repair Heating Water Reset Controls	Hot water boilers usually operate at a fixed water temperature. This measure would modify the controls to adjust the boiler water temperature with outside air temperatures.
Two-Speed Pump Motors	Installing a two-speed pump motor to drive loop pumps will save energy by using the lower pump speeds during the non-heating season.
Repair Leaking Water Valve	Leaking valves waste substantial quantities of hot water, and should be repaired to save energy and reduce system make-up water.
Variable Pumping of High-Pressure, High-Temperature Water	High-pressure, high temperature water usually is pumped at a constant rate even though the actual quantity of water needed varies. Variable pumping will save pumping energy and provide an adequate quantity of water to points to use.
Trip Pump Impellers	When chilled water and/or heating water pumps are oversized in the initial design or through water system modifications, they waste energy. A pump impeller can be trimmed to lower the pump capacity to match the current need. Alternatively, replacing the old pumps with a new, properly sized pump should be considered.
HVAC HEATING	
Add Heating/Ventilating Roof-top Units	When a large area in one building is conditioned during unoccupied hours, because a small area in the large zone served by an air handler requires continuous occupied temperature control, energy is wasted. The installation of a small roof-top unit could allow the temperature to be set back in most of the area served by the large air handler during unoccupied times, and thus save energy during unoccupied times. Thermal and electrical energy would be saved.
Automatic Oxygen Trim	An automatic oxygen trim system can be effectively used on larger boilers to improve operating efficiency by reducing excess air from the boiler burner. Boilers rated at 400 BHP or greater should be considered as candidates for automatic oxygen and trim control.
Boiler Tune-up	Boilers should be tuned before each heating season, and sometimes more often. As with all machinery, age and operation cause parts to wear and get out of alignment or adjustment. This ECM would involve tune-ups and adjustments to all boiler equipment.
Boiler Turbulators	Turbulators are configured strips of metal that can be inserted into fire tubes, in tube-type steam boilers, to improve boiler efficiency. The turbulators improve heat transfer between the combustion hot gases and the fire tubes. Turbulators should not be considered for installation in fire tube hot water boilers, or boilers with atmospheric burners.
Energy-efficient Furnaces	Replace existing natural gas-fired furnaces with more efficient units.
Replace Electric Boilers with Natural Gas-Biomass or Alternate Fuel-fired Boilers	The cost per BTU of electrical energy used to heat facilities is much greater than the cost per BTU of natural gas. Converting to natural gas, biomass, or alternate fuel-fired boilers will reduce the energy cost of heating buildings with electricity.
Stack Gas Economizer	A stack gas economizer is used to transfer the heat in the boiler exhaust gases to the boiler feed water. On large boilers with high stack gas temperatures, this action can increase the efficiency of the boiler.
Steam Traps	Steam heating systems require some mechanism to keep the steam in the heating coil long enough to give off its heat through condensing water from vapor to liquid. This is done by the way of steam trap. Most steam traps have moving parts that operate either on temperature of the steam and condensate or on buoyancy from the liquid condensate. As with any moving part, these need periodic checking and repair or replacement when a malfunction is noted. Failed steam traps will waste steam heat, cause space temperature control problems, and promote condensate return power failure. Leaking steam traps should be repaired or replaced as soon as the leakage is found.
Preheat Combustion Air	The efficiency of boilers will increase 1 percent for every 40 degrees F that combustion air is preheated. Warm air can be drawn from the ceiling area of the heating plant and directed to the air inlet for the boiler burner to increase boiler efficiency.
Replace Domestic Hot Water Boiler	This measure would replace old, inefficient boilers with new energy-efficient units.

Blowdown Heat Recovery	Steam boiler skimmer blowdown now being sent to drain can be run through a heat exchanger to preheat boiler make-up water.
Install Summer Boilers	Large boilers are often operated during the summer even though the boiler load is only a small fraction of the rated capacity (for example, ¼ or less). Radiation losses for the large boilers are constant and much larger than from a small summer boiler. Stack losses can also be higher, and burner combustion efficiency is often lower than that of a small summer boiler. In addition, a small summer boiler is expected to require less labor to operate and may be turned off at night. Consequently, operator and fuel savings are expected by installing a summer boiler.
Discontinue Idling Standby Boilers	Standby boilers are often kept hot so they can be brought on-line in a hurry in the event that the primary boiler goes down. This practice is wasteful because of the radiation losses from the idling boiler. There is usually enough time to bring the standby boiler on line from a cold start, so energy used by idling a backup boiler can be saved.
Reduce Simultaneous Heating & Cooling	Interior and perimeter systems are normally controlled separately, but interact in buildings that use an open office desk arrangement. The interior systems cool while the perimeter systems heat. Controls can be adjusted to eliminate or minimize simultaneous heating and cooling.
VFD Driven Feedwater Pumps	Steam boilers will frequently have feedwater pumps, which run continuously with water not pumped into the boiler being bypassed back to the pump inlet with a three-way valve. This feedwater control wastes electrical energy. Variable frequency drives (VFDs) can be installed to drive the feedwater pumps at a speed needed to maintain the feedwater line pressure at a selected level. Significant electrical savings will be realized since motor power varies as the cube of pump speed.
VFD on Combustion Air Fans for Large Boilers	Combustion air is delivered to a boiler burner with a constant speed fan. The volume of air is normally controlled by the inlet vanes on the blower (fan). Removing inlet vanes on the blower and installing a VFD power supply to drive the blower motor is more efficient than varying the air delivery by controlling blower inlet vanes.
WATER & SEWER	
Low-flow Showerhead	The standard showerhead flow rate is 5 to 7 gallons per minute. Water-efficient showerheads are now available that use 2.5 gallons per minute. Since many communities now have substantial water and sewer rates in place, which are based on metered water consumption, utility costs can be avoided using water-efficient showerheads. Thermal energy will also be saved.
Low-flow Flush Toilet	Old standard flush toilets use about 3.5 gallons per flush. New water-efficient flush toilets use about 1.6 gallons per flush. Replacing the old toilets will save over 50 percent of the water and sewer charges associated with this ECM.
Low-flow Urinal	Standard urinals use about 2 gallons per flush. New low-flow urinals use about 1.5 gallons per flush. Replacing old urinals or retrofitting existing units with low-flow flush valves will save about 25 percent of the water used by urinals. Both water and sewer costs are saved.
Sewer Meter	When sewer costs are based on metered water to a facility but significant quantities of water do not enter the sewer, a sewer cost reduction often can be obtained by installing a sewer meter. However, if rainfall is significant and ground water is allowed to infiltrate into the sewer, costs for sewage could actually increase.
Install Cooling Tower for Condensing Water	Many refrigeration units for coolers and freezers, as well as some air conditioners, use potable tap water for condensing media. This practice results in water and sewage charges. Costs often can be reduced by installing a cooling tower to provide the cooling media for these units.
Water Metering	Meters often can be installed on cooling towers and irrigation systems to measure water that does not run into the sanitary sewer. The meter reading of this water can be used to justify a reduction in sewer charges.
Below-ground Surface Watering	Installing a system that delivers water near the root level is a very efficient way to water vegetation. Over-spray with droplet drift and surface evaporation is eliminated.
MISCELLANEOUS	
Electric to Natural Gas or Solar Domestic Hot Water Heaters	Buildings heated with electrical energy also have electric domestic hot water heaters. When the heating system for these buildings is converted to natural gas-fired hot water boilers, the electric water heaters also should be replaced with natural gas units, to take advantage of the lower cost of natural gas.
Insulate Domestic Hot Water Tank	This measure would install insulation on domestic hot water tanks.
Insulate Steam to Hot Water Converter	Installing insulation on the steam-to-hot-water converter will decrease the heat that is lost from the heating system.
Manage Space	Occupied temperatures are often maintained in building or building areas to accommodate a few people. Consolidating activities in one area of a building would allow the rest of the building to be heated to a lower temperature during the heating season or have cooling turned off during the cooling season. Managing space should also reduce security problems.
Cogeneration (Including Renewable Energy)	High electric rates and low natural gas rates, coupled with a continued need for hot water, would strongly suggest that cogeneration be considered to reduce energy costs.

Control Air to Refrigeration Compressor Room	Often, one room contains the refrigeration compressor equipment for walk-in coolers and freezers for an institutional kitchen. A fan draws a constant volume of air through this room to carry away refrigerant condenser heat. The fan may be equipped with inlet vane dampers, which are not currently used to control fan air volume. This measure would install controls that would vary the quantity of outside air drawn through the room based on the temperature of the air in the room thus saving electrical energy.
Energy-efficiency Motors	Whenever electric motors burn out or are changed for other reasons, replacing them with energy-efficient units should be considered. Energy-efficient motors will operate at efficiencies ranging from 2 –5 percent better than standard electric motors. Caution! Savings will not be realized in some applications, such as direct-drive pumps.
Heat Recovery Run-around Loop	Air handlers that use 100 percent outside air and matched exhaust streams can be fitted with coils and interconnected piping, thereby allowing thermal energy from the exhausted stream to be recovered and used to precondition outside air.
Pool Room Humidity Control	Humidity in the swimming pool room can be controlled with a heat pump, which uses pool water as the condensing media and then returns the condensed moisture to the pool. Thus, the evaporative heat loss is returned to the pool water, which offsets most of the pool water heating. Relative humidity is kept below 60 percent by condensing the moisture that evaporates from the pool, so very little outside air is required.
Insulate Condensate Return Lines	This measure would insulate condensate return lines that run through tunnels or other unheated spaces.
Swimming Pool Cover	Moisture that evaporates from a swimming pool requires heated pool water to maintain a fixed pool water temperature. In addition, outside air must be drawn into the pool room to keep the relative humidity below 60 percent to avoid degradation of the building envelope. A pool cover floated on the water surface when the pool is not in use will eliminate most of the heating associated with controlling the pool water temperature. As a result, heating the outside air to room temperature during that time will be avoided, thus reducing make-up water needs and lowering chemical use.
Indoor Swimming Pool Humidity Control Using a VFD	In certain areas of the country, where outdoor air is very dry, a constant volume of air is drawn into the pool area and heated to room temperature, and a like quantity of air is exhausted. This ECM would use a variable-frequency drive controlled by a humidity sensor, so only enough air is drawn in and exhausted to keep the relative humidity at approximately 55 percent.
Power Factor Correction	Most electrical utilities assess a cost penalty when the power factor drops below a certain level, i.e., 80 percent. They may also pay an incentive for a high power factor, i.e., above 90 percent. Low power factors are normally lagging power factors that are encountered when inductive electrical motors are operated at part load. Lagging power factors can be corrected by adding a bank of capacitors at the transformer station for a facility.
Recover Heat from Refrigerant Condenser Water	Heat can often be recovered from refrigerant condensers and used to heat domestic hot water or process water. For this ECM to be viable, a match must be made between available energy from the refrigerant condenser and a need for hot water.

In addition to equipment installation, the performance contractor may propose various repair and maintenance services. Often contractors propose repairs to existing systems, such as re-installation of damaged or missing controls or repair of leaks in chilled water piping. Generally the contractor assumes responsibility for preventive maintenance and repairs to all new equipment installed. The contractor may also offer to take responsibility for maintenance and even operation of existing equipment. For example, the contractor may offer to provide remote monitoring and adjustment of temperature set-points with a computerized temperature control system. Because any equipment installed is ultimately owned by the facility, the contractor also provides documentation for all installed equipment, including as-built drawings and operating manuals.

The contractor also trains the on-site Customer staff to operate and maintain the equipment. In some cases, performance contractors even pay the costs to have facility personnel attend training programs provided by equipment manufacturers.

What to look for in an ESCO

The commitment to perform and energy performance contract project is a long-term commitment to an ESCO as a partner. The following are some criteria to consider when selecting your ESCO partner:

1. Financial Strength. Look for companies that have been around and will be around once your projects are installed. Request an annual financial statement from the companies to review their financial capability and stability.

2. Industry Commitment. Look for an ESCO who is active in promoting energy efficiency through channels such as Rebuild America, Energy Star, Leadership in Energy and Environmental Design (LEED), or the Energy Services Coalition. Look for ESCOs who support end user groups such as APPA, ASBO, NASEO, NACUBO and others. Companies who are in the business for the long haul know the importance of committing resources to the industry they serve.

3. Experience and References. Focus on the ESCO team's technical expertise and experience – especially in successfully identifying, installing and completing projects similar to yours. Contact references. Are they satisfied with the energy savings and the final results? How was their experience in working with the ESCO?

4. Professional Licenses and Certifications. Engineers, construction managers, etc. should all have the proper licenses, and certifications in Idaho. This protects the Customer and ensures the project team are experienced in implementing projects in the State.

Accreditation

- NAESCO
  The National Association of Energy Service Companies is the industry's trade organization. NAESCO accreditation means that an ESCO has been recognized for the company's technical and managerial competence. Accreditation is granted after careful review by an independent panel of industry experts, none of whom is affiliated with the companies under consideration. Accreditation is granted for a specific time period after which companies must seek re-accreditation and undergo a renewal review.

- DOE/DOD
  The U.S. Department of Energy and the Department of Defense have been initiating energy performance contracts for a number of years and maintain a listing of qualified ESCOs that all federal agencies can tap into when looking to do a project.

It should be noted that no ESCO professional association has statutory, operational or jurisdictional authority in governing the activity of its members. Therefore, a careful review of each company's experience and references is important to assure your selection of a qualified firm best fits your needs and objectives. It is also advisable to work with the appropriate agency to obtain guidance in the process of implementing an ESPC project. Contact the Division of Public Works for state agencies, and the Office of Energy Resources for other public institutions.

How do I get started?

Step One

Obtain 3-5 years worth of utility history on your buildings.

Step Two

To obtain guidance in the performance contracting process contact the following:

- For State Owned Buildings
  Tim Mason
  Division of Public Works
  502 N. 4th Street
  P.O. Box 83720
  Boise, ID 83720-0072
  208.332.1900
  tim.mason@adm.idaho.gov

- For Other Public Institutions
  Sue Seifert
  Office of Energy Resources
  322 E. Front Street
  P.O. Box 83720
  Boise, ID 83720
  208.327.4904
  sue.seifert@oer.idaho.gov

Step Three

Learn all you can about the opportunities

- http://www.energyservicescoalition.org/
- www.naesco.org
- Contact others in Idaho who have completed or are in the process of implementing an energy savings performance contract.

Step Four

Prepare your RFQ for selection of an ESCO.

Idaho Statutes

TITLE 67
STATE GOVERNMENT AND STATE AFFAIRS
CHAPTER 57
DEPARTMENT OF ADMINISTRATION

67-5711D. ENERGY SAVINGS PERFORMANCE CONTRACTS. (1) Definitions. As used in this section:

(a) "Cost-savings measure" means any facility improvement, repair or alteration to an existing facility, or any equipment, fixture or furnishing to be added or used in any existing facility that is designed to reduce energy consumption and energy operating costs or increase the energy efficiency of facilities for their appointed functions that are cost effective. "Cost-savings measure" includes, but is not limited to, one (1) or more of the following:

(i) Procurement of low-cost energy supplies of all types, including electricity, natural gas and water;
(ii) Insulating the building structure or systems in the building;
(iii) Storm windows or doors, caulking or weather stripping, multiglazed windows or door systems, heat-absorbing or heat-reflective glazed and coated window and door systems, additional glazing, reductions in glass area or other window and door system modifications that reduce energy consumption;
(iv) Automated or computerized energy control systems;
(v) Heating, ventilation or air conditioning system modifications or replacements;
(vi) Replacing or modifying lighting fixtures to increase the energy efficiency of the lighting system;
(vii) Energy recovery systems;
(viii) Cogeneration systems that produce steam or forms of energy such as heat, as well as electricity, for use primarily within a building or complex of buildings;
(ix) Installing new or modifying existing day lighting systems;
(x) Installing or modifying renewable energy and alternate energy technologies;
(xi) Building operation programs that reduce energy costs including, but not limited to, computerized programs, training and other similar activities;
(xii) Steam trap improvement programs that reduce energy costs;
(xiii) Devices that reduce water consumption; and
(xiv) Any additional building infrastructure improvements that produce energy cost savings, significantly reduce energy consumption or increase the energy efficiency of the facilities for their appointed functions and are in compliance with all applicable state building codes.

(b) "Director" means the director of the department of administration or the director's designee.

(c) "Energy cost savings" means any expenses that are eliminated or avoided on a long-term basis as a result of equipment installed or modified, or services performed by a qualified energy service company or a qualified provider, but does not include merely shifting personnel costs or similar short-term cost savings.

(d) "Financial grade energy audit" means a comprehensive building energy systems audit performed by a professional engineer licensed in the state of Idaho for the purpose of identifying and documenting feasible energy and resource conservation measures and cost-savings factors.

(e) "Performance contract" means a contract between the director or the public entity and a qualified provider or a qualified energy service company for evaluation, recommendation and implementation of one (1) or more cost-savings measures. A performance contract may be structured as either:

(i) A guaranteed energy savings performance contract, which shall include, at a minimum, the design and installation of equipment and, if applicable, operation and maintenance of any of the measures implemented. Guaranteed annual savings must meet or exceed the total annual contract payments made by the director or the user agency or the public entity for such contract, including financing charges to be incurred over the life of the contract; or

(ii) A shared savings contract, which shall include provisions mutually agreed upon by the director and the qualified provider or qualified energy service company as to the rate of payments based upon energy cost savings and a stipulated maximum energy consumption level over the life of the contract.

(f) "Person" means an individual, corporation, partnership, firm, association, limited liability company, limited liability partnership or other such entity as recognized by the state of Idaho.

(g) "Public entity" means the cities, counties and school districts or any political subdivision within the state of Idaho.

(h) "Qualified energy service company" means a person with a record of established projects or with demonstrated technical, operational, financial and managerial capabilities to implement performance contracts and who currently holds an Idaho public works contractor license appropriate for the work being performed.

(i) "Qualified provider" means a person who is experienced in the design, implementation and installation of energy efficiency and facility improvement measures, who has the ability to secure necessary financial measures to support energy savings guarantees and the technical capabilities to ensure such measures generate energy cost savings, and who currently holds an Idaho public works contractor license appropriate for the work being performed.

(2) Performance contracts. The director of the department of administration, subject to the approval of the permanent building fund advisory council, or any Idaho public entity may enter into a performance contract with a qualified provider or qualified energy service company to reduce energy consumption or energy operating costs. Cost-savings measures implemented under such contracts shall comply with all applicable state and local building codes.

(3) Requests for qualifications. The director of the department of administration or the public entity shall request qualifications from qualified providers and qualified energy service companies inviting them to submit information describing their capabilities in the areas of:

(a) Design, engineering, installation, maintenance and repairs associated with performance contracts;

(b) Experience in conversions to a different energy or fuel source, so long as it is associated with a comprehensive energy efficiency retrofit;

(c) Postinstallation project monitoring, data collection and reporting of savings;

(d) Overall project experience and qualifications;
(e) Management capability;
(f) Ability to assess the availability of long-term financing;
(g) Experience with projects of similar size and scope; and
(h) Other factors determined by the director or the public entity to be relevant and appropriate relating to the ability of the qualified provider or qualified energy service company to perform the project.

(4) Notice. Adequate public notice of the request for qualifications shall be given at least fourteen (14) days prior to the date set forth therein for the opening of the responses to the request for qualifications. Such notice may be provided electronically or by publication in a newspaper of general circulation in the area where the work is located.

(5) Public inspection. All records of the department or an agency or the public entity relating to the award of a performance contract shall be open to public inspection in accordance with the provisions of sections 9-337 through 9-347 and 67-5725, Idaho Code.

(6) Award of performance contract.

(a) The director or public entity shall select up to three (3) qualified providers or qualified energy service companies who have responded to the request for qualifications. Factors to be considered in selecting the successful qualified provider or qualified energy service company shall include, but not be limited to:
- (i) Fee structure;
- (ii) Contract terms;
- (iii) Comprehensiveness of the proposal and cost-savings measures;
- (iv) Experience of the qualified provider or qualified energy service company;
- (v) Quality of the technical approach of the qualified provider or qualified energy service company; and
- (vi) Overall benefits to the state or the public entity.

(b) Notwithstanding the provisions of section 67-5711C, Idaho Code, the director or the public entity may, following the request for qualifications and the expiration of the specified notice period, award the performance contract to the qualified provider or qualified energy service company which best meets the needs of the project and whose proposal may or may not represent the lowest cost among the proposals submitted pursuant to this section.

(c) Upon award of the performance contract, the successful qualified provider or qualified energy service company shall prepare a financial grade energy audit which, upon acceptance by the director or the public entity, shall become a part of the final performance contract.

(7) Installment payment and lease-purchase agreements. Pursuant to this section, the director or the public entity may enter into a performance contract, payments for which shall be made by the user agency or public entity. Such performance contracts may be financed as installment payment contracts or lease-purchase agreements for the purchase and installation of cost-savings measures. Financing implemented through another person other than the qualified provider or qualified energy service company is authorized.

(8) Terms of performance contract.

(a) Each performance contract shall provide that all payments between parties, except obligations upon termination of the contract before its expiration, shall be made over time and that the objective of such performance contract is the implementation of cost-savings measures and energy cost savings.

(b) A performance contract, and payments provided thereunder, may extend beyond the fiscal year in which the performance contract becomes effective, subject to appropriation by the legislature or by the public entity, for costs incurred in future fiscal years. The performance contract may extend for a term not to exceed twenty-five (25) years. The permissible length of the contract may also reflect the useful life of the cost-savings measures.

(c) Performance contracts may provide for payments over a period of time not to exceed deadlines specified in the performance contract from the date of the final installation of the cost-savings measures.

(d) Performance contracts entered pursuant to this section may be amended or modified, upon agreement by the director or the public entity and the qualified provider or qualified energy service company, on an annual basis.

(9) Monitoring and reports. During the term of each performance contract, the qualified provider or qualified energy service company shall monitor the reductions in energy consumption and cost savings attributable to the cost-savings measures installed pursuant to the performance contract and shall annually prepare and provide a report to the director or the public entity documenting the performance of the cost-savings measures.