Guide To
Energy Performance Contracting
2007 Revision

Department of Business, Economic Development, & Tourism

Energy, Resources, & Technology Division

June 2008

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The information contained in this document is current as of December 2006. You are welcome to use any material contained in this document, but we request that credit be given to the Department of Business, Economic Development, and Tourism (DBEDT) and it be cited as the source. This document is a revision of the *Guide to Energy Performance Contracting* (1998), revised in 2004 by the Washington State Department of General Services, and further revised by Tetra Tech EM, Inc., for DBEDT under the administrative direction of Carilyn O. Shon, Manager Energy Efficiency Branch, DBEDT. Elizabeth S. Raman is Project Manager.

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LIST OF ABBREVIATIONS

B&F	Hawaii State Department of Budget and Finance
DBEDT	Hawaii State Department of Business, Economic Development, and Tourism
ECM	Energy (and/or Water) Conservation Measure
EPC	Energy Performance Contract or Contracting
ESCO	Energy Services Company
HRS	Hawaii Revised Statutes
IGA	Investment Grade Audit
IPMVP	International Performance Measurement & Verification Protocol
kWh	kilowatt-hour
M&V	Measurement & Verification
O&M	Operations & Maintenance
RFP	Request for Proposals
SID	Strategic Industries Division (of DBEDT)

1. INTRODUCTION

Most State and County agencies face increasing energy costs and the need to replace or upgrade aging, inefficient, and obsolete energy-consuming systems. Although these needs are often evident, capital improvement and operating budgets have typically been inadequate to fund the needed upgrades. To address these concerns, *Energy Performance Contracting* has been developed as an innovative approach to implementing energy and water conservation measures in a facility or facilities, using guaranteed energy and water savings to finance the projects. The Strategic Industries Division of the Hawaii State Department of Business, Economic Development, and Tourism (DBEDT) has prepared this *Guide* to help State and County agencies make use of energy performance contracts to achieve energy and water savings in their facilities and provide for long-term maintenance.

As described in this *Guide*, Energy Performance Contracting (EPC), first and foremost, allows agencies to implement energy and water saving projects that budget constraints would otherwise prevent. Under an EPC, an Energy Services Company (ESCO), generally a private-sector general contractor, identifies potential energy and water conservation project(s). These projects can then be implemented using the ensuing reduction in utility bills to cover the costs of energy and water conservation equipment, contractor's services (project development and execution), and financing. The agency can receive new and improved lighting, cooling, and other equipment without incurring any up-front project costs, which is very advantageous when the needed capital improvement funds are not in the current budget. After project costs have been paid off, the agency owns the equipment and retains all of the savings for the remaining useful life of the equipment.

A key aspect of this approach is that the contractor guarantees that the energy and water savings, which must be measured and verified at specific intervals, will cover all project costs. If the savings guarantee is not met, the contractor is obligated to pay the difference to the agency. The use of measurement and verification and continuous commissioning help the agency and the ESCO ensure that the savings guarantee and performance levels are met.

The use of energy performance contracts by State of Hawaii agencies is authorized (and encouraged) by Hawaii Revised Statutes (HRS) Sections 36-41 196-21 and 196-22, as amended. In summary, these statutes require State of Hawaii agencies to reduce energy and water use in their facilities and operations through the use of energy-savings contracts, including energy performance contracts.

2. WHAT IS AN ENERGY PERFORMANCE CONTRACT?

The section provides an overview of Energy Performance Contracts, what sets them apart, and their benefits.

2.1 Overview of Energy Performance Contracting

An Energy Performance Contract (EPC) is a comprehensive agreement in which an energy services company (an ESCO) performs an investment grade energy audit, and develops, designs, arranges financing for, installs, and often operates and maintains energy- and water-saving improvements for a customer, such as a State or County agency. Third-party lending institutions generally finance EPC projects. The agency uses utility bill savings generated by the project to pay off the original investment, plus financing and maintenance costs, over the term of the contract, which can be up to 20 years.

Annual energy savings are contractually guaranteed by the ESCO. To ensure accountability, all EPCs include a formal measurement and verification (M&V) plan that specifies procedures the ESCO must follow to demonstrate that the installed energy conservation measures are delivering the guaranteed savings. If the savings guarantee is not met in a given year, the ESCO must pay the agency the difference between the guaranteed amount and the actual verified amount. This savings guarantee places the risk of performance on the ESCO, not the agency.

2.2 How are EPCs Different?

Energy performance contracting differs significantly from the contracting methods typically used by State and County agencies to procure energy efficiency services and equipment, as discussed below.

2.2.1 Conventional Contracting

The conventional, *design-bid-build* process of purchasing energy-efficiency improvements can require several separate solicitations and contract awards. First, an agency solicits engineering services for a study to identify potential energy conservation measures at a specified facility. After reviewing the completed study, the agency selects the measures to be implemented and solicits proposals for engineering design services. Once the designer is selected and completes the plans and specifications, the agency issues one or more invitations for bids to select contractors who will install the improvements. Finally, the agency solicits bids to request preventive maintenance services for any equipment the facility is unable to maintain with in-house staff. Throughout this

process, the agency must identify and set aside adequate funding to pay for the various design and construction costs.

In recent years, several State and County agencies have employed a *design-build* contracting system to implement construction projects. Design-build is similar to performance contracting in that it brings the design and construction professionals together onto a single project team, working under a single contract. This approach eliminates the need for multiple solicitations and contract awards, and condenses the project schedule by overlapping the design and construction phases of the project.

2.2.2 Energy Performance Contracting

An energy performance contract allows for a comprehensive approach to energy and water savings that is more desirable and cost effective than a single measure approach. EPCs actually contain several agreements in the form of technical schedules that specify various requirements of project performance occurring over several time periods. Projects rely on the technical expertise of an energy services company (ESCO) to design and build a comprehensive and creative technical solution to rising energy costs. The significant benefit of energy performance contracting for governments is that it allows operating cost savings to pay for improvements.

Energy performance contracts go further than the typical design-build contract, and 1) include a measurement and verification function to validate energy savings; 2) require that the energy savings cover all project costs; and 3) usually use third party financing. ESCOs are required to guarantee energy savings and, based on an annual reconciliation, reimburse the agency for any savings below the guarantee. Energy performance contracting replaces the unwieldy, multi-step process of a conventional procurement with a single request for proposals covering all aspects of the project, and one services contract with the selected proposer.

A more detailed description of the energy performance contracting process can be found in Section 4 of this *Guide*.

2.2.3 Utility Energy- Efficiency Service Contracts

Under Hawaii Revised Statutes Section 196-11, amended in 2002, utility energy-efficiency services are defined as demand-side management services provided by a utility to improve the efficient use of a commodity, such as electricity and gas. Such services may include energy efficiency and renewable energy project auditing, financing, design, installation, operation, maintenance, and monitoring.

Utility energy-efficiency service contracts are similar to energy performance contracts, the most notable difference being that projects are financed and

implemented through a utility rather than a private-sector contractor. There is no up-front cost to the agency for energy improvements, and project costs are paid through utility bill savings. Federal agencies often enter into these types of agreements to implement energy improvements at their facilities.

The utility provides no operations and maintenance (O&M) services, limited or no formal measurement and verification of energy savings, and energy savings are not guaranteed. This results in the agency accepting the risk of the installed systems not performing as expected.

2.3 Benefits of an EPC

Energy performance contracting offers a number of features that address the concerns of many agencies in dealing with increased energy costs and the need to replace worn-out equipment, while lacking the necessary funding, expertise or resources. These beneficial aspects of an EPC include the following:

- A single procurement is used to purchase a complete package of services in which one contractor is accountable for obtaining financing, development, design, procurement, installation, maintenance, and operation of the energy conservation measures to guarantee optimum performance.
- All costs associated with the energy efficiency improvements are paid for with utility cost and operations and maintenance (O&M) savings (Figure 1-1). This allows projects to be paid for with existing utility budget avoided costs, and no up-front funds are needed.

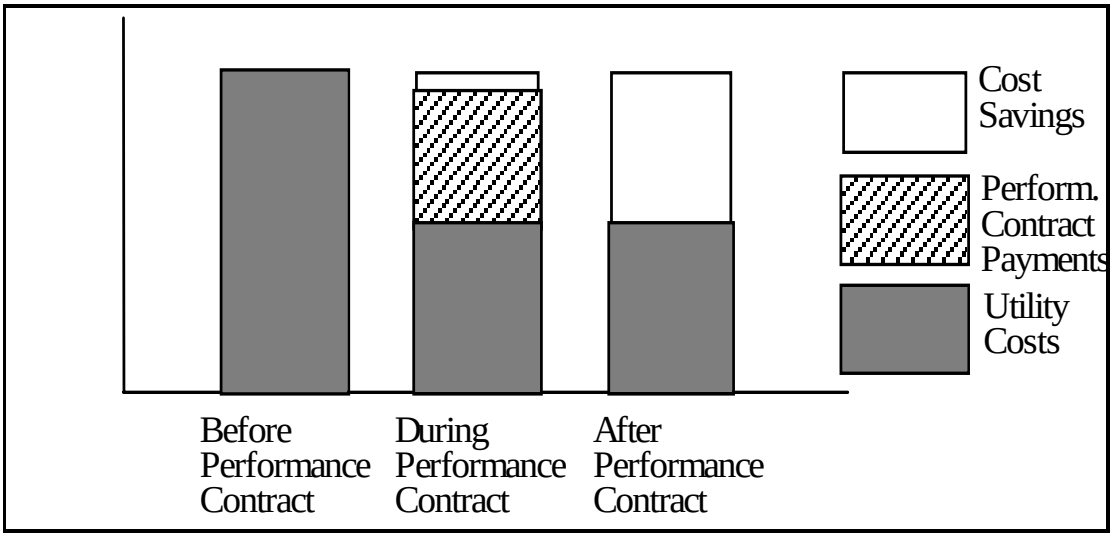

Figure 1-1. Energy Performance Contract Cost Savings

- An EPC is structured so that payments to the performance contractor are contingent on the actual level of energy savings achieved. By law, the energy

cost savings produced by the project must be greater than project costs. A performance contract thus pays for itself. As savings must be guaranteed by the ESCO, it is in the contractor's interest to maximize the energy savings and ensure that the savings can be repeated for each year of the contract term. This translates into reliable equipment and system performance, and dollar savings for State and County agencies.

- The contractor can arrange financing for the energy efficiency improvements.
- Energy cost savings from an EPC can be used to pay for needed non-energy capital improvement projects. Budgetary concerns are acutely felt in all levels in the public sector, and funding constraints often result in the delay (and sometimes omission) of needed equipment replacement, maintenance and renovation.
- Energy system repair and maintenance costs associated with inadequate, aging, or outdated equipment are a substantial component of fixed operating costs, and a properly implemented EPC can significantly reduce these costs.
- Replacing costly and aging energy equipment as part of an EPC will improve building operating efficiency and tenant comfort, resulting in reduced costs, less need for equipment maintenance, and fewer tenant complaints.
- As part of its performance-contracting obligation, the ESCO will provide up-to-date technical training on the operation and maintenance of installed equipment to building managers and agency staff.
- When in-house expertise is unavailable, the cost structure of an EPC can be arranged to allow for the retention of an independent performance contract manager to oversee the ESCO and represent the agency's interests.
- ESCOs commonly retain local subcontractors to work on a performance contract. This leads to economic development benefits, including the creation of "green" jobs and contributions to local economic growth. It is estimated that one-third of the cost of every performance contract project is spent on labor.
- Many ESCOs offer staff who are LEED* accredited, familiar with the U.S. Environmental Protection Agency's (EPA's) Energy Star tools and resources, and can help facilities qualify for these programs. Energy Star tools such as the Cash Flow Opportunity Calculator are useful in determining value of a project.

* LEED is the acronym for "Leadership in Energy and Environmental Design," a green building rating system developed by the U.S. Green Building Council, that provides a list of standards for environmentally sustainable construction.

3. EPC FINANCING

Under an energy performance contract with guaranteed savings, the facility owner does not make any upfront cash payments, and the cost of energy efficiency improvements is paid from achieved energy savings. In order to meet these requirements, the ESCO assumes the performance risks associated with developing, implementing, operating and financing the project. This means that the ESCO:

- Arranges or facilitates the necessary construction financing;
- Arranges or facilitates long-term financing so that the annual repayment obligation is less than the project's annual achieved savings; and
- Absorbs any financial loss if the project's ongoing debt service exceeds achieved savings.

Most ESCOs have established relationships with financial institutions willing to provide financing for EPC projects. While the repayment obligation ultimately resides with the agency, the ESCO is financially liable for any shortfall that might occur in the achievement of savings needed to cover the debt service. Financial or lending institutions generally regard the savings guarantee of a credit-worthy ESCO as a benefit.

3.1 Financing Mechanisms

Capital for energy-efficiency improvements is available from a variety of public and private sources, and can be accessed through a range of financing options. In general, there are four financing mechanisms available for investments in energy efficiency; 1) internal funding; 2) traditional debt financing, 3) tax-exempt lease and lease purchase agreements; and 4) utility, state and local government incentives. These mechanisms are described below.

3.1.1 Internal Funding

Energy improvements are paid for by the direct allocation of appropriated funds from an organization's operating or capital budgets. Such allocations are normally made as a part of the organization's annual budgeting process.

Internal funding is the simplest and most direct way to pay for energy improvements, and is commonly used to fund smaller, short-term projects. For larger projects, such as those addressed by an energy performance contract, sufficient internal funds are often not available due to budget shortfalls or competing operating or capital investment needs.

3.1.2 Traditional Debt Financing

Energy-efficiency improvements for State facilities can be financed through simple two-party, commercial loans for smaller projects, or from proceeds from municipal bonds issued for larger, long-term projects. In either case, terms of principal and interest repayment can usually be negotiated so that savings from the installed energy improvements provide at least break-even cash flow for the agency.

3.1.3 Tax-Exempt Lease and Lease-Purchase Agreements

A tax-exempt lease purchase agreement is an effective alternative to traditional debt financing (bonds, loans, etc.) because it allows a public organization to pay for energy upgrades by using money that is already set-aside in its annual utility budget. When properly structured, this type of financing makes it possible for public sector agencies to draw on dollars to be saved in future utility bills to pay for new energy-efficiency equipment and related services today.

Because the interest component of the lease payments to the financing institution is exempt from Federal income taxes, the financier is able to pass these tax savings back to the agency in the form of lower interest rates.

In Hawaii, a tax-exempt lease-purchase agreement does not constitute a long-term "debt" obligation because of non-appropriation language that must be written into the agreement. This language effectively limits the payment obligation to the agency's current operating budget period (typically 12 months). The agency will, however, have to assure lenders that the energy efficiency projects being financed are considered of *essential use* (i.e., essential to the operation of the agency), which minimizes the non-appropriation risk to the lender. If for some reason future funds are not appropriated, the equipment is returned to the lender and the repayment obligation is terminated at the end of the current operating period without placing any obligation on future budgets.

Tax-exempt lease-purchase agreements can be written as a master lease in which the lease's general terms and conditions are included, but specific projects are not. As an entity begins an individual project, lease schedules are appended to the master lease agreement. This method is common where an EPC is carried out in phases or for multiple State entities.

When a financing agreement is part of a State government performance contract, the agreement becomes subject to HRS Section 37D. The prior written approval of the State Director of Budget and Finance (B&F) and the Attorney General are therefore required before implementation of any financing agreement. In the case of a financed lease, the Department of Budget and Finance may become the

lessee. Early consultation with B&F and the Attorney General is strongly recommended.

3.1.4 Utility, State and Local Government Incentives

While not strictly a project financing mechanism, utility incentives can be used to reduce the overall cost of a project and decrease the amount that needs to be financed. As of 2006, Hawaiian Electric Company offers three types of incentives:

- **Energy Study Reimbursement** - for engineering and design of energy-efficient systems for new construction or retrofit projects;
- **Prescriptive Rebates** - cash rebates for purchasing and installing prescribed energy-efficiency systems (lighting, air conditioning, etc.); and
- **Customized Rebates –** awarded for purchasing and installing worthy energy systems not specifically covered by the prescriptive rebates.

Some state and local governments issue special financing alternatives for energy efficiency and renewable energy projects. For example, in June 2004 the Honolulu City Council approved Bill 14, which included a $7.85 million bond for solar and energy-efficiency retrofits for Honolulu public buildings.

3.2 Recommended Financing Approach

Tax-exempt lease financing, generally arranged or facilitated by the ESCO, is one of the most common methods used by public agencies to finance EPC projects. As previously mentioned, the interest rates are significantly lower than interest rates for commercial lease-purchase arrangements because the interest payments are tax-exempt income to the investor. A tax-exempt lease typically does not require public approval or constitute a long-term debt obligation of the agency. In addition, this type of financing provides for title to the equipment to be retained by the agency, with a security interest in the equipment held by the investors. Lease payments may be subject to annual appropriations, with a non-appropriations provision standard to the lease agreement and accepted by the lending community. The ready access to sources of tax-exempt lease financing makes this method, especially when combined with available utility rebates, an attractive and popular way for public agencies to finance energy projects.

3.3 Financing Regulations for State Agencies

As mentioned in the introduction to this Guide, the use and financing of energy performance contracts by State of Hawaii agencies must conform to Hawaii Revised Statutes Sections 36-41 and 196-21. Section 196-21 states that agencies

shall maximize their use of alternative financing contracting mechanisms, including energy performance contracts. Both Sections 36-41 and 196-21 also state that:

> Agencies that perform energy efficiency and renewable energy system retrofitting may continue to receive the budget appropriations for energy expenditures at an amount that will not fall below the pre-retrofitting energy budget, but will rise in proportion to any increase in the agency's overall budget for the duration of the performance contract or payment term.

In other words, these statutes allow the agency to retain their original budget for utility costs even though utility bills will decrease as a result of the installed energy and water conservation measures. The difference between the original and reduced utility costs, of course, is what pays the cost of the EPC. Thus, the ability of the agency to retain its full utility budget is essential to a performance contract.

4. THE ENERGY PERFORMANCE CONTRACTING PROCESS

The steps necessary to initiate and complete the process of awarding an Energy Performance Contract are summarized in Table 4-1. As shown, the process begins with the identification and refinement of a potential energy efficiency project or projects, proceeds through the designation of an EPC project team and project manager, and concludes with selection of an ESCO and award of the performance contract. Each of these steps is described in further detail in the following paragraphs.

Table 4-1
Steps in the Energy Performance Contracting Process

STEP	ACTION	DURATION
1	IDENTIFY POTENTIAL ENERGY EFFICIENCY PROJECT(S)	1-3 MONTHS
2	DEFINE AND DEVELOP THE PROJECT ▪ IDENTIFY EPC PROJECT TEAM AND PROJECT MANAGER ▪ DEVELOP PROJECT PROFILE AND OBJECTIVES	1 MONTH
3	SELECT A CONTRACTOR (ESCO) ▪ DRAFT AND ISSUE A REQUEST FOR PROPOSALS (RFP) ▪ CONDUCT PRE-PROPOSAL MEETING AND SITE VISIT ▪ EVALUATE PROPOSALS AND SELECT AN ESCO ▪ NEGOTIATE AND AWARD ENERGY PERFORMANCE CONTRACT; AUTHORIZE-INVESTMENT GRADE AUDIT	7-12 MONTHS (or longer depending on project complexity)
4	INITIATE PROJECT ▪ ESCO CONDUCTS INVESTMENT-GRADE ENERGY AUDIT ▪ REVIEW AND ACCEPT INVESTMENT-GRADE ENERGY AUDIT REPORT	6-9 MONTHS (or longer depending on project complexity)
5	SUBMIT PROJECT PLANS AND ARRANGE FINANCING	1 MONTH
6	AMEND ENERGY PERFORMANCE CONTRACT	1 MONTH

4.1 Step One – Identify Potential Energy Efficiency Project(s)

Before undertaking an EPC, feasible energy and water conservation measures should be identified. A feasibility evaluation can be as simple or sophisticated as

the agency wants to make it. A simple approach to determining the feasibility of an EPC is to pose the following two questions:

- Are the facilities' energy and water bills more than $100,000 a year?
- Do the energy saving opportunities add up to a project investment greater than $100,000 with a simple payback period of less than 7 years (excluding financing, ESCO fees, etc.)?

If so, an energy performance contract may be appropriate. It is likely to be of further benefit if the facilities are characterized by:

- Minimal availability of funds for energy related capital improvements;
- Aging buildings or equipment;
- Recurring maintenance problems or high maintenance costs;
- Comfort complaints;
- Scarce budget resources;
- Too little energy management expertise;
- Too many demands on maintenance staff;
- No recent upgrades of lighting, air conditioning, or controls systems; and
- Energy-using equipment that is ready for replacement.

4.2 Step Two –Define and Develop the Project

4.2.1 Identify EPC Project Team and Project Manager

Managing an energy performance contract will require expertise from several departments, both within and outside the agency, including facilities planning, procurement, budget and finance, maintenance, and legal. To coordinate these needs, an EPC project manager should be identified and an EPC project team formed early in the process. The project team will need diverse capabilities, including:

- Engineering expertise to evaluate energy efficiency potential, develop a scope of work, establish maintenance requirements, and help evaluate ESCO proposals and energy studies;
- Procurement and contracting expertise to ensure that the process follows applicable procurement rules during the request for proposals and contract award phases;
- Knowledge of budget and finance procedures to establish a method to budget and make payments for the duration of the contract; and

- Legal expertise to review all contract terms and assist in negotiations after an ESCO has been selected.

In addition, because a financing agreement will likely be required to fund the energy performance contract with the ESCO, the State Department of Budget and Finance and the Attorney General's office should be involved early in the process.

The EPC Project Manager should be an individual from the implementing agency who is willing, able and authorized to oversee the project and act as an internal champion and project proponent. In agencies where appropriate in-house expertise might not be available, it may be possible within the EPC budget to include an outside performance contract manager to oversee the ESCO and represent the agency's interests. Nevertheless, even with the retention of outside expertise, the regular participation and involvement of an internal Project Manager significantly enhances the prospects for a successful project.

4.2.2 Develop Project Profile and Objectives

Those facilities that will be the subject of the EPC should be profiled and relevant information regarding their operation drawn together. Generally, such information would include the facilities' size, energy use, equipment, operating schedule, maintenance problems, and any equipment replacement or renovation plans. Also included would be the utility bill history for the past three years, if available.

The objectives of the EPC program should be clearly identified. For example, what energy problems need to be solved; will ESCO or agency staff assume equipment maintenance and repair responsibilities; might the ESCO be tasked to work on non-energy projects?

Rather than pre-determining a detailed scope of work specifying what energy and water projects the ESCO should undertake, it is generally more productive to use the ESCO's technical expertise to help identify and assess the resource conservation opportunities that are most cost-effective.

4.3 Step Three –Select a Contractor (ESCO)

In accordance with Hawaii Revised Statutes Section 36-41, energy performance contracts are awarded through a public Request for Proposals (RFP) process. This process is designed to identify the organization (the ESCO) most qualified to implement the EPC program based on comparing relative abilities, experience, and expertise. In addition, as the ESCO selected to implement the EPC program will be a partner for as long as 20 years, it is important to select one that the agency is comfortable working with and that shares the agency's vision. The

RFP process is an excellent way to identify interested ESCOs, compare approaches, and evaluate compatibility and commitment.

Prior to issuing the RFP, it is important to have funds identified for temporary obligation for the initial phase of the contract: conducting an investment grade energy audit of the project facilities. The performance contract will guarantee that energy savings will pay for all project costs, including the cost of the audit. Should the agency decide not to proceed with the contract after an acceptable audit has been completed, the ESCO would be reimbursed for its efforts. Generally, the cost of an investment-grade audit ranges between 15 and 25 cents per square foot; however, in some instances, costs may be somewhat higher or lower depending upon the complexity of existing equipment and the effort required to collect accurate data.

4.3.1 Draft and Issue a Request for Proposals (RFP)

The RFP defines the scope of the project, project schedule, the procurement process, evaluation criteria, special contractual terms and conditions, and specific corporate and technical information to be submitted by the ESCO in writing. In addition, the RFP should clearly state that guaranteed energy savings must pay for all project costs for the duration of the contract. This requirement establishes the financial performance parameters of the installed project.

The RFP addresses the essential components common to an energy performance contract. It will be necessary to prepare the following project-specific information and procedures for incorporation into the RFP document.

- A project overview, describing the purpose and objective of the project; identification of the facilities to be considered; and their current energy use, facility size, and any unique conditions.
- Identification of the services desired, such as energy audit, engineering design, equipment procurement and installation, construction management, equipment commissioning, energy savings measurement and verification, project financing (sometimes, the ESCO is asked to obtain at least three preliminary bids for financing), and equipment operation and maintenance.
- Contractual terms and conditions that will apply to the project.
- A description of the required proposal format and content.
- Instructions for proposal submission, and a timetable for proposal review and ESCO selection.
- A description of the evaluation criteria that will be used as the basis for selection, including the relative importance of price and other

evaluation factors. Development of objective criteria is critical for ensuring that only the most qualified ESCO is selected.

Key information requested in the RFP should include:

- The ESCO's experience with implementing performance-contracting arrangements, and its understanding of and experience with the energy conservation measures that are likely to be installed.
- The ESCO's financial stability and experience with project financing.
- The background and EPC experience of all key project personnel specifically assigned to the project.
- The performance record of past EPC projects directly managed by the ESCO.
- The calculation methodologies used to compute base-year utility use and project savings.
- The ESCO's methods of savings measurement and verification (M&V).
- A description of the recommended operations and maintenance (O&M) program to be implemented and a detailed listing of other services provided by the ESCO.
- The proposed structure of the savings guarantee and ESCO fee payments.
- A sample investment-grade energy audit, project-commissioning plan, O&M plan, and M&V plan.
- Cost of the investment-grade energy audit should no contract be negotiated.
- Training services to be provided to facility staff.

The RFP should be sent to at least three ESCOs to ensure adequate competition among technically qualified firms. A list of accredited ESCOs is available at http://www.naesco.org/.

4.3.2 Conduct Pre-Proposal Meeting and Site Visit

Following release of the RFP but before submission of proposals, it is recommended that a pre-proposal meeting and a site visit be scheduled for all interested ESCOs. The purpose of these meetings is to answer any questions regarding the RFP and proposal content; and for potential proposers to become acquainted with the proposed project facilities, interview facility and agency staff, and clarify technical matters.

The site visit will provide the information necessary to prepare an accurate and credible cost estimate for the investment-grade energy audit that each ESCO must included in their proposals. Likewise, the ESCOs' ability to provide appropriate sample audit, commissioning, M&V, and O&M plans will depend on observations made during the site visit. For very large and complex projects, ESCOs may request, and should be afforded, the opportunity to make a second visit to the proposed facilities.

4.3.3 Evaluate Proposals and Select ESCO

Based on the criteria set forth in the RFP, proposers' qualifications are evaluated for skills, expertise, experience, and cost elements. The Hawaii Administrative Rules provide that the agency's procurement officer, or an evaluation committee selected by the procurement officer, evaluate proposals. Using a committee allows the evaluation to benefit not only from the expertise within the agency and the on-site knowledge of facility staff, but also from the EPC experience of personnel from other State and local agencies (such as DBEDT and the City/County of Honolulu). It is common for members of the EPC project team to also serve on the proposal evaluation committee.

Before the evaluation committee receives copies of the proposals, the procurement officer screens them to identify any that are clearly non-responsive as to content or form. In addition, the procurement officer evaluates whether the proposing ESCOs are credible organizations and meet the minimum qualifications stated in the RFP. Once responsive proposals have been identified, the evaluation committee members read, evaluate, and rank them. A numerical ranking system is used to rank the proposals.

The Hawaii Administrative Rules for competitive sealed proposals allow interviews with competing offerors and discussion of potential changes in their proposals, including price. Such discussions are optional, and a contract award can be made without any interviews; however, it is important to select an ESCO that agency and facility staff can relate to over an extended period of time. Thus, face-to-face interviews with the project teams identified in two or three of the highest-ranked proposals are strongly recommended. The use of a numerical, quantitative rating system to rank the proposers is a necessary requirement.

By tabulating the numerical rating data collected from the written proposal review and oral interview phases, a final ranking for each ESCO can be determined. The highest-ranked ESCO thus identified should be notified of its selection, and invited to enter into negotiations for the performance contract.

4.3.4 Negotiate and Award Energy Performance Contract

The energy performance contract is the road map for implementing and tracking the project over the term of the agreement. It should clearly define each party's roles and responsibilities and explicitly state how savings are determined and how the guarantee will function. The contract should detail the relationship between the agency and the ESCO: who is going to do what, when, at what cost, and under what conditions. Because of the long-term nature of this relationship, the contract must be carefully developed and flexible enough to accommodate both the current and future needs of the facility for the duration of the contract term.

Key topics that should be considered in developing your EPC are described below.

- **Types of Energy Performance Contracts –**The most common, and preferred, form of contracting for energy efficiency services in Hawaii is the EPC with a guaranteed energy savings provision. In this type of contract, the ESCO guarantees that the energy savings produced by the project will be greater than all project costs. If the guaranteed level of savings is not met, then the ESCO pays the agency the difference.

  A Power Purchase Agreement (PPA) is a type of Design–Build–Own–Operate contract that reflects some of the characteristics of an EPC. A PPA is a long-term agreement between an energy producer and a customer to provide electricity, hot water, etc. at guaranteed long-term rates. The power generator provides the design, financing, maintenance and support for all elements of the energy system, including management of rebates and other government financial incentives. The customer purchases the measurable output of the project (e.g., kilowatt hours) from the generator rather than from the local utility, and the generator guarantees minimum performance and services. Energy efficiency projects can be combined with renewable and on-site power generation projects into a PPA.

  It is important to note that EPCs are carefully negotiated agreements designed to meet the individual needs of the customer. They may contain components of a variety of EPC terms and conditions, and because it is rare that two customers have exactly the same needs, rarely are two agreements exactly the same.

- **Performance Contract Financing –** As discussed in Section 3, third-party municipal, or tax-exempt, leasing has developed as a tool to finance EPCs in a manner that meets the basic objective of debt -

spreading the cost of financing over the life of an asset - while avoiding statutory limitations on the issuance of public debt that exist in most jurisdictions. The Hawaii State Judiciary, as well as Hawaii and Kauai Counties, have successfully used tax-exempt leases to finance performance contracts in the recent past.

- **Required Contract Terms –** Hawaii Revised Statutes Sections 36-41 and 196-21 require that the following conditions be included in any performance contract entered into by a State agency:
  - The term of any energy-savings contract entered into pursuant to this section shall not exceed twenty years;
  - Any contract entered into shall contain the following annual allocation dependency clause:

    > The continuation of this contract is contingent upon the appropriation of funds to fulfill the requirements of the contract by the applicable funding authority. If that authority fails to appropriate sufficient funds to provide for the continuation of the contract, the contract shall terminate on the last day of the fiscal year for which allocations were made.

  - Any energy-savings contract may provide that the agency ultimately shall receive title to the energy system being financed under the contract; and
  - Any energy-savings contract shall provide that total payments shall not exceed total savings.

  The State of Hawaii Equipment-Lease Rider contains additional terms and conditions that must be applied to any lease agreement entered into by State agencies.
- **Scope of Services -** The ESCO's initial effort under the performance contract will be completing a comprehensive, investment-grade audit of energy and water use at the proposed project facilities. The purpose of the audit is to identify, quantify, and prioritize viable energy and water savings opportunities for all facets of facility operations. The investment-grade audit is addressed in further detail below, under Step 4 of the EPC process.

  The performance contract award should explicitly authorize and conditionally approve funding for the energy audit. It is important to carefully establish criteria for the factors to be addressed in the audit. The audit cost can be rolled into the energy performance contract, but it must be paid in full if the agency does not proceed with the contract

and carry out the recommended energy conservation measures. If the agency's criteria are not met, they do not pay for the audit.

In addition to formally authorizing and obligating funds for the energy audit, the performance contract should anticipate either: 1) an amendment to the contract after the energy audit has been accepted to authorize energy conservation measure design, financing, and construction; 2) payment to the ESCO for the audit should the agency choose not to proceed with the project; or 3) termination of further dealings with the ESCO should the energy audit not be acceptable.

4.4 Step Four –Initiate Project

4.4.1 ESCO Conducts Investment Grade Energy Audit

As described above, the ESCO's initial effort under the EPC is conducting an investment-grade energy audit (IGA), an engineering and economic analysis of potential energy and water saving projects in a facility. The IGA:

- Provides information on current energy- and water-consuming equipment and operations, and validates the facilities' utility billings;
- Identifies and recommends technically and economically feasible resource efficiency improvements for existing equipment and operations, and
- Provides the customer with sufficient information to judge the technical and economic feasibility of the recommended energy and water conservation measures.

The ESCO initiates the audit by collecting data and background information concerning facility operation and energy use for the most recent three years. It will be important for the agency to work diligently to furnish the ESCO with any operational data it may request.

The ESCO then interviews appropriate management, engineering, and maintenance personnel regarding equipment usage, operating schedules, recurring maintenance problems, significantly high maintenance costs, comfort complaints, and any energy-using equipment that is ready for replacement. The ESCO will also complete an on-site engineering survey of facilities and inspect any major energy-using equipment, including lighting, air conditioning systems, electric motors, water usage, automatic temperature control systems, hot water systems, etc. The resulting data are used to develop a preliminary list of potential energy and water conservation measures (ECMs). At this phase, the ESCO will also determine current annual, or baseline, energy and water

consumption for the individual systems that would be affected by the potential ECMs.

An IGA Report is then provided to the agency. The report describes the potential for utility savings, the approximate cost of the conservation measures necessary to achieve these savings, and a cash flow projection indicating the overall financial and programmatic effects of the project. Description of analysis methodology, supporting calculations, and assumptions used to develop a baseline and estimate savings is included.

4.4.2. Review and Accept Investment Grade Energy Audit Report

The agency reviews the IGA report and meets with the ESCO to discuss the proposed energy and water conservation measures and projected project costs and economics, and determine measures to further analyze. The goal of this meeting is to structure a project that includes a combination of short and longer payback ECMs that provide an acceptable simple payback and financed term, and ensures that the project can be fully funded from the resulting energy savings. The ECMs selected should reflect only those measures the agency is comfortable in pursuing.

After basic agreement is reached, the ESCO will prepare and submit a revised audit report, which will form an essential part of the energy performance contract.

4.5 Step Five –Submit Project Plans and Arrange Financing

Concurrent with preparation of the investment-grade audit report, the ESCO will submit a series of formal project plans, to include a:

- **Commissioning Plan** - to establish a systematic process of ensuring that the proposed array of energy conservation measures will be installed and tested to perform according to the design intent and the facility's operational needs. The plan should also address a continuous commissioning process to assure the performance of the ECMs over the life of the project.
- **Measurement and Verification Plan** – to explain how the guaranteed savings from each of the proposed ECMs will be measured and verified. Section 6 discusses the M&V process in further detail.
- **Operations and Maintenance Plan** – describing the activities the ESCO will perform related to routine, preventive, scheduled, and unscheduled actions to prevent equipment failure or decline, with the goal of increasing efficiency, reliability, and safety. Relative O&M

responsibilities of the ESCO and agency personnel should be addressed in the plan, as well as any training the ESCO will provide.

- **Financing Plan –** describing how the EPC project will be financed, including available interest rates and financing terms based on interest rates available to the agency, and how construction financing will be handled during the project development and build-out period. Further details on project financing are provided in Section 3.

4.6 Step Six –Amend Energy Performance Contract

Following the review and formal acceptance of the investment-grade audit report and draft project plans, the agency makes a decision whether to proceed to the next phase of the project: design and installation of the identified energy and water conservation measures. Should the determination be made to proceed, the performance contract would be amended in writing to establish mutual agreement on the equipment and systems the ESCO will design and install, energy baseline measurement, financing, construction, commissioning, energy savings measurement and verification, and maintenance services. Proceeding thus with the performance contract would require no additional obligation of funds, as the ESCO will guarantee that the energy cost savings produced by the installed ECMs will cover all project costs including the cost of the IGA.

5. MONITORING AND MANAGING THE ENERGY PERFORMANCE CONTRACT

As described in Section 4, an energy performance project is initiated by completing an investment-grade audit, arranging project financing, preparing draft project plans, and then finalizing the energy performance contract. Subsequent stages (See Table 5.1) include the:

- **Design Phase –** consisting of the design and installation planning for the agreed-upon energy conservation measures (ECMs);
- **Construction Phase –** wherein the ECMs are installed;
- **Commissioning Phase –** to assure installed ECMs are operating as designed and delivering the guaranteed savings; and
- **Performance Monitoring –** monitoring of maintenance activities, standards of service and comfort, and energy-savings over the life of the performance contract. The formal measurement and verification of energy savings is discussed in Section 6.

The key to successfully managing the project through these phases is to facilitate timely and complete communication between the ESCO, the agency's EPC project team, and key facility staff. Meetings held at major project milestones establish a pattern of communication and mutually agreed benchmarks that can then be used to monitor and control the progress of the project. Table 5-1 summarizes major milestones and topics that need to be discussed and resolved. In addition to the milestone meetings, a schedule of regular (weekly) project meetings during the construction phase helps prevent surprises and keeps the ESCO on track.

Although management of the design and construction phases of the EPC seems essentially the same as the management of a large design-build retrofit or repair and maintenance project, performance contracts are more complex. EPCs incorporate a number of technical schedules that specify various requirements of performance over different time periods that have been agreed on as part of the audit process. They include financing and guaranteed savings agreements, and continuous commissioning to ensure all ECMs are operating correctly and interacting properly with other building systems and equipment to provide the guaranteed savings. Staff training, equipment maintenance, monitoring standards of service and comfort, and measuring and verifying savings are also important. Unlike construction management efforts, which are completed once the installation has been accepted, these other activities require ongoing attention for the duration of the EPC (up to twenty years) in order to receive full value

from the project. Of singular importance is the regular measurement and verification of energy savings, a topic addressed in detail in Section 6.

The annual project review meetings recommended during the performance monitoring phase are not a substitute for the regular tracking of maintenance activities or standards of service and comfort. Rather, they supplement these ongoing activities and provide an opportunity for a comprehensive review of the performance of the project on a facility-wide basis. Because they are not in response to an immediate problem, they make it easier to observe trends and longer-term facility changes. They also serve as an annual opportunity for facility staff to ask questions and offer suggestions to the ESCO regarding how to optimize system performance.

Table 5-1
Milestone Meetings in Managing the Various Phases of an EPC

PHASE	ACTION
DESIGN	**PRE-DESIGN MEETING** ▪ **ISSUE NOTICE TO PROCEED WITH DESIGN AND INSTALLATION PLANNING** **INSTALLATION PLANNING MEETING** ▪ **PRESENT AND DISCUSS INSTALLATION PLANS** ▪ **PRESENT AND DISCUSS COMMISSIONING PLAN** **WEEKLY STATUS REPORT MEETINGS**
CONSTRUCTION	**INITIAL CONSTRUCTION MEETING** ▪ **REVIEW PAYMENT AND PERFORMANCE BONDS** ▪ **REVIEW AND APPROVE CONSTRUCTION PLAN AND SCHEDULE** ▪ **PROVIDE A LIST OF CONTACTS AND REVIEW SITE ACCESS AND ADMINISTRATIVE PROCEDURES** ▪ **ISSUE NOTICE TO PROCEED WITH CONSTRUCTION** **WEEKLY PROGRESS MEETINGS** ▪ **PROVIDE CONSTRUCTION PROGRESS REPORTS** ▪ **REVIEW AND RESOLVE ANY CONSTRUCTION ISSUES**
COMMISSIONING	**ISSUE NOTICE OF CONSTRUCTION COMPLETION (CERTIFICATE OF SUBSTANTIAL COMPLETION)** **REVIEW AND APPROVE:** ▪ **PLAN FOR ACCEPTANCE TESTING OF WORK** ▪ **PLAN FOR FACILITY PERSONNEL TRAINING** ▪ **PLAN FOR INSTALLATION DOCUMENTATION** ▪ **SCHEDULE FOR YEAR-ONE PREVENTIVE MAINTENANCE** ▪ **SCHEDULE FOR YEAR-ONE MEASUREMENT ACTIVITIES**
PERFORMANCE MONITORING	**ANNUAL PROJECT REVIEW MEETING** ▪ **REVIEW OF ANNUAL RECONCILIATION REPORT AND STANDARDS OF SERVICE** ▪ **REVIEW SCHEDULE FOR NEXT YEAR'S MEASUREMENT ACTIVITIES** ▪ **REVIEW SCHEDULE FOR PREVENTIVE MAINTENANCE AND TRAINING** ▪ **DISCUSS AND RESOLVE OTHER OUTSTANDING ISSUES**

6. MEASURING AND VERIFYING ENERGY SAVINGS; PROJECT COMMISSIONING

An energy savings project should include savings measurement and verification and project commissioning in order to ensure persistent energy savings and reliable equipment performance.

6.1 Measurement and Verification

The foundation of an energy performance contract is the assumption that the installed energy conservation measures will result in reduced energy use, allowing the ensuing cost savings to be used to pay for energy services and loan servicing for the duration of the contract. In an EPC project, it is essential not only to measure the energy savings, but also to verify those savings and associate them with specific ECMs. Measurement and verification (M&V) is the formal process of determining and documenting that the installed ECMs are producing the guaranteed savings. In essence, it is a savings-verification tool.

Measurement and verification procedures allow quantification of the operation of ECMs and calculation of the performance and energy savings. Savings are determined by comparing energy use before and after an energy retrofit, and adjusting for all non-retrofit changes that affect energy use.

6.1.1 Measurement and Verification (M&V) Plan

An M&V plan is an integral part of an energy performance contract. This plan is a set of agreed-upon metrics and procedures that are used to establish baseline performance as well as to verify actual energy savings. In other words, the M&V plan defines precisely what "energy savings" means for an energy efficiency project, and specifically how savings will be quantified. The M&V plan also addresses unforeseen events that may occur over the course of the performance contract, such as changes in utility rates; variations in weather; or changes in building use, occupancy, and operating hours.

A good M&V plan should:

- Identify and establish a baseline for the project(s).
- Identify appropriate M&V options for different ECMs.
- Define the boundaries (individual energy systems or whole building) of the ECMs for savings determination, and rigorously document the methodology for determining the baseline conditions and the resultant baseline energy data.

- Specify quality control and quality assurance procedures for data collection as well as the format in which annual M&V reports will be submitted.
- Include cost estimates for both the initial instrumentation and recurring M&V tasks.

The selection of the appropriate method to calculate the energy baseline and measure energy savings depends partially on what energy efficiency measures are adopted. Normally, the improvements to be adopted are not known at the time of the solicitation. Instead, the first task of the ESCO is to complete an investment-grade energy audit (IGA) to identify and propose these improvements. Because of this, the ESCO should describe the method(s) used to calculate the energy baseline and measure energy savings in its IGA. The agency would then have an opportunity to review and approve or reject the ESCO's proposed method(s) in their review of the IAG.

One of the most contentious issues with respect to M&V has been the use of stipulations for reporting energy savings. (According to the International Performance Measurement and Verification Protocol (IPMVP), whenever a parameter is not measured, it should be treated as a stipulated value; see Option A in Table 6-1.) At the heart of the debate is the perception that M&V strategies that emphasize metering can be very expensive and do not provide as much value. Indeed, there are situations where stipulations based on reasonable assumptions or historical data can substitute for expensive instrumentation, keeping the cost of the project down. Past experience has shown that EPC customers, without fully realizing the risks and the associated uncertainties that come with unreasonable stipulations, may opt for the lowest cost M&V option while sacrificing the necessary accuracy to confirm savings.

6.1.2 Measurement and Verification Protocols

The U.S. Department of Energy, recognizing significant potential for energy efficiency investment, began in 1994 to work with industry to develop a set of best practices for M&V. This work led to the establishment of the International Performance Measurement & Verification Protocol (IPMVP). The latest revision of the IPMVP was released in early 2007.

The IPMVP is used throughout the United States and the world to help standardize concepts and options for measuring and verifying energy and water savings. The State of Hawaii has incorporated the IPMVP into State energy performance contracts, and most performance-contracting firms adhere to the IPMVP.

The IPMVP offers four options for measuring and verifying performance and energy savings at the individual project level. These options, titled A, B, C, and

D, are the cornerstones of the standardized set of procedures contained in the IPMVP. In brief, Options A and B focus on the performance of specific ECMs. Option C assesses the energy savings at the whole-facility level by metering and analyzing utility costs before and after the implementation of ECMs. Option D is based on computer simulations of the energy performance of equipment or the whole facility, permitting the determination of savings when base-year retrofit data are unreliable or unavailable. Each M&V Option and its relative accuracy and cost is explained in further detail in Table 6-1.

Table 6-1
Description of IPMVP Options

OPTION	DESCRIPTION & RELATIVE ACCURACY	RELATIVE COST
A. Partially Measured Retrofit Isolation	**Savings are determined by partial field measurements of an ECM's energy use. Some but not all parameters may be stipulated. Used when highly accurate measurements are not necessary or economically viable.**	**Lowest cost option.**
B. Retrofit Isolation	**Savings are determined by short-term or continuous field measurement of an ECM's energy use. Used to track long-term performance when accurate savings measurements are needed.**	**Medium cost option, depending on availability of existing submeters and amount of metering needed.**
C. Whole Facility	**Savings are determined by measuring energy use at the whole facility level. Short-term or continuous measurements are taken throughout the post-retrofit period.**	**Medium to high cost option, depending on the amount of metering needed.**
D. Calibrated Simulation	**Savings are determined through simulation of the energy use of components or the whole facility. Simulation routines must be demonstrated to adequately model actual energy performance measured in the facility. Typically used for new construction or where baseline data are unavailable or unreliable**	**Usually the highest cost option.**

Further information regarding measurement and verification can be found in the *M&V Guidelines* document published by the Federal Energy Management Agency, and the *M&V Resource List,* a frequently updated document that provides an extensive collection of resources and tools available to help users apply the International Performance Measurement and Verification Protocols. Section 9 of this document provides links to the World Wide Web pages where these documents are available.

6.2 Commissioning and Retro-commissioning

Hawaii Revised Statutes Section 196-11 defines commissioning, as follows:

> Commissioning means a quality-oriented process, which takes place during design and construction, for achieving, verifying, and documenting that the performance of facilities, systems, and assemblies meets defined objectives and criteria with regards to energy conservation design strategies and energy performance of buildings.

"Retro-commissioning", is the process of monitoring a facility after construction is complete. It is addressed under HRS 196-11 as:

> Retro-commissioning means a quality-oriented process which takes place after systems have been placed in operation, for achieving, verifying and documenting that the performance of facilities, systems, and assemblies perform as closely as possible to defined performance criteria, with regards to energy conservation design strategies and the energy performance of buildings.

It is desirable to include commissioning and retro-commissioning activities in an energy performance contract.

7. ENERGY AND WATER SAVING EQUIPMENT AND SERVICES

Energy 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. Passive energy improvements can also be included in an EPC. These may consist of daylighting techniques to reduce the amount of lighting required, or installation of window film to prevent heat build-up and reduce the amount of glare associated with sunlight.

Water conserving equipment and practices may also be included in an EPC. Typical improvements include low-flow showerheads and toilets, and improvements to landscape irrigation systems.

Generally, an ESCO will include any improvement expected to recover its own cost (including maintenance and interest expense) in energy or water 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 faster payback items.

In addition to equipment installation, the ESCO may propose various repair and maintenance services. Often ESCOs propose repairs to existing systems, such as re-installation of damaged or missing controls or repairs of leaks in chilled water or landscape irrigation piping. Generally, the ESCO assumes responsibility for preventive maintenance and repairs to all new equipment installed. The ESCO may also offer to take responsibility for maintenance and even operation of existing equipment. For example, the ESCO may offer to provide remote monitoring and adjustment of temperature setpoints with a computerized temperature control system.

Because any equipment installed is ultimately owned by the facility, the ESCO also provides documentation for all installed equipment, including as-built drawings and operating manuals. The ESCO also trains the on-site facility staff to operate and maintain the equipment. In some cases, ESCOs even pay the costs to have facility personnel attend training programs provided by equipment manufacturers.

For those agencies where in-house expertise is unavailable, the cost structure of an EPC can be arranged to allow for the retention of an independent performance contract manager to oversee the ESCO and represent the agency's interests.

8. ENERGY PERFORMANCE CONTRACTING BY GOVERNMENT AGENCIES

Energy performance contracting has been used for over two decades by local government agencies throughout the United States to promote energy efficiency. In some States (such as Kansas), energy performance contracting provides the primary basis for funding energy efficiency projects by State agencies. Other States (such as Texas, Pennsylvania and Colorado) *require* the use of EPCs before drawing on appropriated funds for feasible energy efficiency projects.

At the Federal level, $1.9 billion in private-sector funds have been invested in EPC projects in 46 states, including Hawaii. These projects will save Federal agencies and departments over $5.3 billion in energy costs.

In Hawaii, DBEDT's Energy Performance Contracting Program began in 1988. The State Judiciary, Hawaii Public Housing Authority, Hawaii Healthcare Systems Corporation, County of Kauai, County of Hawaii, and the City and County of Honolulu are actively involved in energy performance contracting. Examples of EPC projects by State and County agencies include:

- **University of Hawaii at Hilo and Hawaii Community College.** The first energy savings performance contract for State of Hawaii facilities encompassed over fifty buildings on the University of Hawaii and Hawaii Community College campuses at Hilo, Island of Hawaii. The performance contract began in October 1996, and ran through February 2007. As of December 2006, the $6.4 million investment in energy efficiency retrofits had produced an estimated $7 million in energy cost savings, and these savings will continue to accrue over the life of the installed improvements. In addition, over $200,000 in maintenance savings is being achieved annually.
- **Hawaii County.** The Hawaii County Building was retrofit with energy efficient equipment in March 1997 using a performance contract. Total investment was $562,000, and energy use was reduced by 30%, or about $65,000 per year. Hawaii County also retrofit 27 fire and police stations around the island at a total cost of $397,000, with approximately $57,000 in annual energy cost savings. A $507,000 energy performance contract for the Hilo and Kona Public Safety Buildings has produced $954,000 in savings to date.
- **Kauai County.** In 1998, Kauai County retrofit 29 government facilities and buildings with energy savings equipment. Total investment was $518,607, with cumulative savings to June 2006, of $389,260. A total of

$680,000 in energy plus operational cost savings is projected over the 10-year project period.

- **City and County of Honolulu.** Under its Energy Services Performance Contracting program, the City & County replaced traffic lights at 400 intersections with red and green LED lights in 2001. This entailed a $1.7 million investment, and $313,000 in annual cost savings are being realized.

  More recent energy performance contract projects include the 2006-2007 retrofit of the Fasi Municipal Building, a $5.6 million investment with $355,000 guaranteed annual cost savings, and the Police Department Headquarters, a $1 million project with $223,000 guaranteed annual cost savings. These projects were financed with City bond funds, saving 2% in interest relative to tax-exempt lease financing. Performance measures include: lighting and HVAC retrofits and improvements, and upgrade of energy management control systems. Average energy cost savings are about 33%.

- **Hawaii Healthcare Systems Corporation HHSC)**. HHSC has undertaken energy efficiency projects at five state hospitals (Kona Community Hospital, Hilo Medical Center, Maui Memorial Hospital, Maluhia Hospital (Oahu), and Kauai Veteran's Medical Center). HHSC's performance contractor estimates a total investment of $21.4 million for these projects, and a cumulative energy cost savings of $44 million over the fifteen-year performance period.

- **The Judiciary.** The Hawaii State Judiciary's performance contract for a $1.5 million lighting retrofit of five courthouses (four on Oahu and one on Maui) was completed in April 2004. The project achieved a 16% energy savings and a reduction of 2 million kilowatt hours. There was a 12% demand reduction of over 400 kilowatts. This equates to an annual savings to the Judiciary of $253,000 (1995 electric rates). Performance measures included converting from T12 to T8 lamps with electronic ballasts, LED exit signs, occupancy sensors, delamping with reflectors, and repairing damaged wiring. The Judiciary received a $97,000 utility rebate for the project that was credited to their utility bills.

9. REFERENCES AND SOURCES OF FURTHER INFORMATION

9.1 State of Hawaii Energy Legislation

State of Hawaii, Hawaii Revised Statutes, Section 36-41 – "Energy retrofit and performance contracting for public facilities"
http://www.capitol.hawaii.gov/hrscurrent/Vol01_Ch0001-0042F/HRS0036/HRS_0036-0041.htm

State of Hawaii, Hawaii Revised Statutes, Section 196-21 – "Financing mechanisms"
http://www.capitol.hawaii.gov/hrscurrent/Vol03_Ch0121-0200D/HRS0196/HRS_0196-0021.htm

State of Hawaii, Hawaii Revised Statutes, Section 196-22 – "State Energy Projects"
http://www.capitol.hawaii.gov/hrscurrent/Vol03_Ch0121-0200D/HRS0196/HRS_0196-0022.htm

9.2 State Energy Performance Contracting Programs

State of Colorado Website on Energy Performance Contracting
http://www.colorado.gov/energy/commercial/performance-contracting.asp

State of Idaho Guide to Energy Performance Contracting
http://www.idwr.idaho.gov/energy/community/Idaho_performance_Contracting_howto.pdf

State of Illinois Energy Performance Contracting Program
http://www.illinoisbiz.biz/dceo/Bureaus/Energy_Recycling/Energy/Energy+Efficiency/epc.htm

State of Pennsylvania Guaranteed Energy Savings Performance Contracting Program for State Agencies
http://www.gggc.state.pa.us/gggc/cwp/view.asp?a=515&q=156992

State of Washington website on Energy Savings Performance Contracting
http://ga.wa.gov/EAS/epc/espc.htm

State of Alabama Energy Performance Contracting Guide
http://www.adeca.alabama.gov/C7/Performance%20Contracting/Document%20Library/AEPC%20Manual.pdf

State of South Carolina Guide to Energy Performance Contracting
http://www.energy.sc.gov/publications/Revised%20PC%20Manual.pdf

9.3 Sample Performance Contracting Documents

Sample Request for EPC Proposals
http://www.energyservicescoalition.org/resources/documents/2-1-RFP.doc

Sample Energy Performance Contract
http://www.colorado.gov/energy/in/uploaded_pdf/AttachG-PerformanceContract.pdf

Example of Master, or Base, Contract for As-Needed Energy Performance Contracting Services
http://www.colorado.gov/energy/in/uploaded_pdf/ESCOBaseContract_000.pdf

Sample Contract for an Investment Grade Energy Audit
http://www.energyservicescoalition.org/resources/documents/3-Audit.doc

9.4 International Performance Measurement and Verification Protocol (IPMVP)

IPMVP Public Library of Documents
http://www.evo-world.org/index.php?option=com_content&task=view&id=61&Itemid=80

9.5 Project Commissioning

Commissioning Guidance for Energy Savings Performance Contracts
http://www1.eere.energy.gov/femp/pdfs/comm_guide_espc.pdf

9.6 Other References

State of Hawaii, Department of Business, Economic Development and Tourism (DBEDT) Strategic Industries Division
http://hawaii.gov/dbedt/info/energy/

Energy Services Coalition Website
http://www.energyservicescoalition.org/resources/index.html

U.S. Environmental Protection Agency
Energy Star Website
http://www.energystar.org/index.html
Cash Flow Opportunity Calculator
http://www.energystar.gov/ia/business/cfo_calculator.xls