NPS-CM-07-112

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An Analysis of the United States Air Force Energy Savings Performance Contracts

10 October 2007

by

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The research presented in this report was supported by the Acquisition Chair of the Graduate School of Business & Public Policy at the Naval Postgraduate School.

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Abstract

The purpose of this paper is to explore the use of Energy Savings Performance Contracts (ESPCs) within the Department of Defense, focusing on the United States Air Force's utility and energy acquisition. The significant value of the ESPC is its alternative financing mechanism that authorizes Federal facilities recapitalization without upfront investments. The paper focuses on Dyess Air Force Base's ESPC, as Dyess's benchmarking ESPC was selected for the Presidential Award recognition for Leadership in Federal Energy Management. The six major contracting processes within the three main management levels encompass many of the best-practice characteristics. The interviews referenced herein with the service end-users, both the regional and local contracting officers, allow the reader to further understand how the Integrated Product Team's significant efforts resulted in a successful ESPC.

Keywords: Energy Savings Performance Contracts

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List of Acronyms

AFB	Air Force Base
AFCESA	Air Force Civil Engineer Support Agency
BTU	British Thermal Units
CBO	Congressional Budget Office
DoD	Department of Defense
DoE	Department of Energy
ECM	Energy Conservation Measures
ECP	Energy Conservation Project
ESCO	Energy Service Company
ESPC	Energy Savings Performance Contract
FEMP	Federal Energy Management Program of DoE
FAR	Federal Acquisition Regulation
IDIQ	Indefinite Delivery/Indefinite Quantity Contract
USAF	United States Air Force

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Executive Summary

Federal budget restraints and funding reductions have called attention to ESPC Federal legislation, following the enactment of the *Energy Policy Act of 1992* (*Public Law 102-486)*. This Federal energy initiative, with the issuance of *Executive Order* (EO) *13123,* mandates that agencies manage energy savings along different, specific consumption baselines. To meet the EO requirements, the United States Air Force established its own six regional Indefinite Delivery, Indefinite Quantity (IDIQ) contracts. Using the same regional ESPC, the Dyess AFB was able to renew its aging infrastructure, which renewal continues to result in less equipment failure and lower utility bills. In both 2003 and 2004, Dyess won Presidential Awards for excellent Leadership in Federal Energy Management. The objective of this study is to provide the reader with an understanding of how ESPCs are being managed from different perspectives. Within the paper, there are three levels of management. The first level is at the national level, which identifies how the public policies lay the legislative groundwork that authorizes all Federal agencies' energy conservation compliance. The second level is at an agency level; it examines how a multifaceted, intricate organization like the United States Air Force (USAF) established its management structure (by means of control, command, and communication) to exceed its energy consumption goal. The last level of management is at an organization level, which investigates what contracting processes Dyess completed that resulted in such a successful ESPC. The research provides a comprehensive study of USAF management structures presented with four distinct levels of organizational roles and responsibilities at: 1) At the Air Force Civil Engineer Service Agency, 2) USAF Facility Energy Management Team, 3) USAF Regional ESPC center, and 4) installation-level management. Each level of management has its own accountable tasking for centralized supervision and delegation for decentralization purposes. With the application of five of the six phases of the contracting processes: 1) procurement planning, 2) solicitation planning, 3) solicitation, 4) source selection,

and 5) contract administration, the research provides an analysis of how the USAF contracts its energy management system.

I. Introduction

A. Introduction

The purpose of this chapter is to provide the reader an introductory layout of this research. The research background presents the basic environmental information and the objectives of the study. The research questions guide the study, while the organization of the discussion clarifies the research. This chapter also includes a list of abbreviations and few definitions for interpretation purposes. The benefits of the study relate to the significant impact of Energy Savings Performance Contracts (ESPCs) on Federal Agencies.

B. Background

Federal budget restraints and funding reductions have called attention to ESPC Federal legislation, following the enactment of the *Energy Policy Act of 1992* (*Public Law 102-486)*. This Federal energy initiative, with the issuance of *Executive Order* (EO) *13123,* mandates that agencies manage energy savings along different, specific consumption baselines. The Department of Energy's Super Energy Savings Performance Contract (ESPC) guided the United States Air Force to establish its own six regional Indefinite Delivery Indefinite Quantity (IDIQ) contracts. The contracting center for the South Region is Randolph Air Force Base (AFB) in Texas. The first ESPC task-order project (valued at $250,000) involved lighting retrofits to improve lighting conditions in three facilities at Lackland AFB. Later, using the same regional ESPC, the Dyess AFB was able to renew its aging infrastructure, which renewal continues to result in less equipment failure and lower utility bills. In both 2003 and 2004, Dyess won Presidential Awards for excellent Leadership in Federal Energy Management.

C. Objectives of the Study

The objective of this study is to provide the reader with an understanding of how ESPCs are being managed from different perspectives. Within the paper, there are three levels of management. The first level is at the national level, which identifies how public policies lay the legislative groundwork that authorizes all Federal agencies' energy conservation compliance. The second level is at an agency level; it examines how a multifaceted, intricate organization like the United States Air Force (USAF) established its management structure (by means of control, command, and communication), to exceed its energy consumption goal. The last level of management is at an organizational level, which investigates what contracting processes Dyess completed that resulted in such a successful ESPC.

D. Research Questions

This research is intended to answer the following five research questions:

1. What is the legislative environment that guides the ESPC**?**
2. How do ESPCs achieve exemption from the parameter of the *Anti-deficiency Act* (*ADA*)?
3. How does the USAF operate its energy management system?
4. What contracting processes does the USAF use for its ESPCs?
5. What is the role of each party at each level within the ESPC support system?

E. Organization

Chapter I provides the introductory information for the research, with the structure of background setting, objectives of the study, research questions, chapter organizations, definitions, and the benefits of the study.

Chapter II provides a broad overview of the birth of ESPCs and the historical background of how public policies meet the nation's energy predicament. The *Energy Policy Act of 1992* (*Public Law 102-48)* and the *Executive Order* (EO) *13123*

will be introduced as the guiding principles of the Energy Savings Performance Contracts (ESPCs) for conservation purposes, which contain several efficiency provisions for Federal facilities. The ESPC's alternative financing mechanism allows the government to make facilities improvements when capital dollars are not available. This chapter presents supporting statement from the statutory 42 USC 8287, which raise appropriation limitations from the *Anti-deficiency Act (ADA).* The chapter also includes the latest legislative policy changes of the provision of House Resolution 6: *Energy Policy: Comprehensive Energy Legislation of the 109th Congress* and the extension of the ESPC eligibility period to 2016.

Chapter III narrows the scope of the research and examines energy management, focusing on the USAF and its contracting process. The USAF fulfills its energy savings efficiency requirements with its regionalized energy management strategy. This chapter will discuss four main topics: 1) the role of the Air Force Civil Engineer Service Agency (AFCESA), 2) the role of the USAF facility energy management team, 3) the USAF Regional Energy Savings Performance Contracts (RESPC), and 4) the roles of the individual installation leadership and contracting officers. This discussion will provide a representation of the USAF energy management structure through a description of each key element of the ESPC system.

Chapter IV uses the standard contracting processes to review the USAF implementations of strategic purchasing with ESPCs. The selected example used to demonstrate the development, implementation, and supervision of an ESPC is the 2003 Federal Energy and Water Management Presidential award winner, Dyess Air Force Base's (Dyess') ESPC. The chapter will explore the six standardized contract processes, including: 1) procurement planning, 2) solicitation planning, 3) solicitation, 4) source selection, 5) contract administration, and 6) contract closeout. Meanwhile, it will also introduce the three main management levels for an ESPC, which are located at different management levels: 1) AFCESA, 2) RESPC, and 3) Dyess AFB. The intermingling matrix consists of the six contracting processes and

three management levels. The management relationship at each process and each level facilitates regionalization, which is the current implementation method of strategic purchasing for energy service management. The later part of the chapter will emphasize the phases of solicitation planning, solicitation, and source selection that resulted in Siemens Building Technologies, Inc., being one of the RESPC contractors. A discussion of the contract administration phase with task ordering and deliveries details will conclude the chapter.

Chapter V will conclude the research paper by providing lessons learned and presenting further research opportunities.

F. Definition

The vocabulary key terms, definitions, and acronyms that will be used throughout this paper are as follows:

The Energy Savings Performance Contract (ESPC) is an innovative contracting method that uses private-sector financing to meet a user's need for an energy management system. According to the *Federal Acquisition Regulation* (*FAR*), this type of contract requires the contractor to:

1. Perform services for the design, acquisition, financing, installation, testing, operation, and where appropriate, maintenance and repair, of an identified energy conservation measure or series of measures at one or more locations;

2. Incur the costs of implementing the energy savings measures, including at least the cost (if any) incurred in making energy audits, acquiring and installing equipment, and training personnel in exchange for a predetermined share of the value of the energy savings directly resulting from implementation of such measures during the term of the contract; and

3. Guarantee future energy and cost savings to the Government.

G. Benefit of the Study

The significant value of an ESPC is its alternative financing mechanism that authorizes Federal facilities to engage recapitalization without upfront investments. The United States Government Accounting Office's December 2004 report commented, "Without ESPCs, agencies would have to reassess their budget plans to accommodate investments in ECMs and/or Congress would be asked to appropriate funds today to finance investments to meet currently required energy consumption goals" (cited in Federal Energy Management Program, 2006, p. 1).

H. Summary

This chapter provides the reader an introductory layout of this research. The research background presents the basic environmental information and the objectives of the study, with the goal of informing the reader what to expect out of the reading. The research questions guide the discussion, while the organization of the paper clarifies the research. The benefits of the study relate to the significant impact of Energy Savings Performance Contracts (ESPCs) toward Federal Agencies. The next chapter will provide a literature review on ESPCs.

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II. Literature Review

A. Introduction

The purpose of this chapter is to provide the literature review of this research. Starting with the history of ESPC Federal legislation, the chapter refers to the *Energy Policy Act of 1992 (Public Law 102-486)* and *Executive Order 13123* with in-depth legislative documentation support. The chapter also answers how the ESPC qualifies for an exemption from the parameter of the *Anti-deficiency Act* (*ADA*), by investigating the statutory interpretation of 42 USC 8287 and the guidance from the Department of Energy specifically for ESPCs. This chapter is intended to answer the following three research questions: 1) what legislative environment guides the ESPC? 2) How was the appropriation inconsistency between the *ADA* and ESPC resolved?, and 3) what was the enabling characteristics for ESPCs to be implemented successfully? Accordingly, the chapter will address three main topics: 1) the history of ESPC legislation, 2) ESPC exemptions from the *Anti-deficiency Act,* and 3) lessons learned in terms of how the *ADA* conflict is being resolved under the current appropriation policy and ESPC legislation.

B. Energy Savings Performance Contracts

Energy Savings Performance Contracts (ESPCs) are performance-based service contracts with Energy Service Companies (ESCOs) for energy conservation projects. The partnering between an ESCO and the government can yield high efficiency in reducing energy consumption. As a contracting vehicle, an ESPC provides federal facilities a way to initiate energy conservation projects with no initial financial government investment. If the project is not able to deliver the promised energy savings, no payment will be made to the ESCO. The program assists government agencies in staying within the annual energy consumption target. For the ESCOs, as their innovative solutions are the profit margin, the more savings they generate, the higher their profit will be.

The win-win partnership offers potential motivation to both the government and the ESCO. Specifically, the partnership with the private sector allows the government to share the industry's expertise. By utilizing an alternative financing mechanism, the government may recover some percentage of the guarantee savings. However, there is no savings guarantee if the energy savings projected do not materialize. This performance-based service contracting allows the government to:

- Make facilities improvements when capital dollars are unavailable,
- Update aging equipment with newer, more efficient products, and
- Reduce energy costs and long-term maintenance costs.

The statement of "make facilities improvements when capital dollars are unavailable" should immediately alert contracting personnel that ESPCs conflict with the *ADA*, a legislation enacted by Congress to prevent the incurring of obligations or the making of expenditures (outlays) in excess of amounts available in appropriations or funds, exercising its constitutional control of the public purse (Environmental Protection Agency, 2004).

C. The History of ESPC Federal Legislation

This section reviews the history of ESPC legislation in the course of, first, the *Energy Policy Act of 1992* (*Public Law 102-486)* and, second, the *Executive Order* (EO) *13123*.

1. Energy Policy Act of 1992 (Public Law 102-486)

According to the DoE's *ESPC Statute (42 USC 8287)—Fact Sheet,* ESPC Federal legislation originated from the *Energy Policy Act of 1992 (Public Law 102-486)*, which falls under the United States Code (USC) Title 42, The Public Health and Welfare, Chapter 91, and ends with Title VIII, Sections 8287 and four subsections (42 USC 8287, 2005). The first support for the above Statute 42 USC 8287 is the *Energy Policy Act of 1992*, *PL 102-486*, containing efficiency provisions

for federal facilities. The Department of Energy's (DoE) Federal Agency Energy Management (FAEM) establishes a number of Federal agency goals and requirements pertaining to Federal facilities and contains relevant, amended portions of the *National Energy Conservation Policy Act of 1978* (*NECPA*). Before describing the legal conflict over entering into contracts without the capital funds being available, the following bullets highlight a few of the *NECPA*'s characteristics, focusing on the role of each key participating agency (Department of Energy, 2006a, p. 1):

- Section 153 authorizes the General Services Administration (GSA) to receive rebates and other incentive payments from utilities and deposit funds into the Federal Buildings Fund for use in energy management improvement programs.
- Section 155, relating to Energy Savings Performance Contracts, provides new language giving agencies the authority to enter into performance contracts and describes the methodology of contract implementation.
- Section 159 directs the Office of Management and Budget to issue guidelines for accurately assessing the energy use in Federal facilities to be used in agency reports to the DoE.
- Section 161 directs the GSA, the Department of Defense (DoD), and the Defense Logistics Agency to identify energy-efficient products on the Federal supply schedules that offer a significant potential for lifecycle cost savings.

The latest *Energy Policy Act of 2005* (*PL 109-58*) was signed into law by President Bush on August 8, 2005, reestablishing a number of Federal agency goals; this act contains relevant, amended portions of the *NECPA*.

2. Executive Order (EO) 13123

The second support for Statute 42 USC 8287 originated from *Executive Order* (*EO*) *13123* (with latest amendment *EO 13423*, *Strengthening Federal Environmental, Energy, and Transportation Management*, as of January 24, 2007), currently titled *Greening the Government through Efficient Energy Management.*

This EO calls upon all Federal agencies to improve the energy efficiency of their buildings, to promote the use of renewable energy, and to reduce greenhouse gas emissions associated with energy use in their buildings, among other energy-related requirements. The EO orders partnership among federal agencies to develop a variety of guidance, criteria, tools, and other information to assist agencies in implementing the provisions of the Order (Department of Energy, 2007b). San Miguel and Summers (2006) agreed that through this EO, the Executive Branch strengthened the government's position on private financing that was already authorized by Congress. The President supported the use of ESPCs as reflected as in this excerpt from *Executive order 13123* Section 403 (a) (Federal Register, 1999, p. 6):

> Financial Mechanisms [...] Agencies shall maximize their use of available alternative financing contracting mechanisms, including Energy Savings Performance Contracts and utility energy-efficiency service contracts, when lifecycle cost-effective, to reduce energy use and cost in their facilities and operations. Energy Savings Performance Contracts, which are authorized under the National Energy Conservation Policy Act, as modified by the Energy Policy Act of 1992, and utility energy-efficiency services contracts provide significant opportunities for making federal facilities more energy efficient at no net cost to the taxpayer. In the big scheme of legislation, the Public Law 109-58 and EO13123 instruct the ESPC.

PL 109-58 and *EO 13123* provide the legislative structure for ESPCs. Title *42 USC* (The Public Health & Welfare), Chapter 91 (National Energy Conservation Policy), Subchapter VII (Federal Energy Initiative), Section 8287 will later present four specific directives.

D. ESPC'S Exemption from Anti-deficiency Act

The ESPC's alternative financing mechanism allows the government to make facilities improvements when capital dollars are not available, which presents a potential conflict with the *Anti-deficiency Act* (*ADA*) (31 USC §1341(a)(1)(A),(B))). With revised Statute 3679, this is a legislation enacted by Congress to prevent the

incurring of obligations or the making of expenditures (outlays) in excess of amounts available in appropriations or funds, exercising its constitutional control of the public purse. It primarily prohibits the Contracting Officer from obligating the government without the appropriated funding. One practical example can be found in the Kentucky Office of Energy Policy; Kentucky's statute confirmed 42 USC 8287, "ESPC is a viable way for governments to save energy and money by securing private sector expertise and financing of energy-efficiency improvement projects […] allows institutions to make building improvements when capital dollars are not available" (Kentucky Office of Energy Policy, p. 1). The following information explains: 1) what key governmental documents are necessary to be familiar with related to ESPCs, and 2) the latest updates supporting the assertion that the *ADA* does not apply to ESPCs.

1. ESPC Statute 42 USC 8287

The first authority that exempts the ESPC from the *ADA* is the ESPC Statute, 42 USC 8287. Foremost, it gives the head of a Federal agency authorization, solely for energy savings and ancillary benefits, to enter into ESPC contracts partnering with the ESCOs. ESCOs are qualified providers or vendors that negotiate and provide services, and in turn share the portion of saved energy, the unspent funding (42 USC 8287, 2005). The performance period of an ESPC cannot exceed 25 years, according to *Federal Acquisition Regulation* (*FAR*) part 23.204 (a) (1). And the funding limitation is intended to cover the contract cost, because the cumulative annual payments by an agency to an ESCO may not exceed the amount that the agency would have paid for utilities without an ESPC during the contract years. Furthermore, 42 USC 8287 provides Federal Agency Secretaries the specific implementation guidelines that concur with the Federal Acquisition Regulatory (FAR) Council.

a. Contract Provision 1—ESCO Profit Limits

The ESPC Statute 42 USC 8287 opening statement that, "the contractor shall incur costs of implementing energy savings measures, including at least the cost

incurred in making energy audits, acquiring and installing equipment, and training personnel, in exchange for a share of any energy savings directly resulting from implementation of such measures during the term of the contract" (Cornell Law School, 2007, p. 2) sanctions contractors' share of savings as long as the contract is awarded and as long as the savings materialize. The underlying stipulation is that the contractor will invest in the facility in advance, retrofit all the obsolete utility fixtures, and perform required maintenance without governmental funding assistance. The savings guarantee is based on auditing historical energy usage and estimated savings the contractor can promote through greater efficiency. For example, in January 2003, Dyess AFB (Dyess) became the largest wind energy user in the US—procuring 100% of its electric power via its ESPC. However, if the ESCO, Siemens Company, can not offset the guaranteed 78 Gigawatt-hours of electrical usage and reduce carbon dioxide emissions by 58,000 tons per year, there will not be any energy savings sharing (Federal Energy Management Program, 2004). Since the USAF would pay the contractual amount of utility expenses monthly, the ESCO would have to reimburse the undelivered promise according to the year-end annual energy auditing report. The contract ensures both contractual parties recognize each other's financial obligation at the beginning.

Subsequently, ESPC Statute 42 USC 8287 indicates that the agency's cumulative annual payments by an agency to an ESCO (under an ESPC), may not "exceed the amount that the agency would have paid for utilities without an energy savings performance contract during contract years" (Cornell Law School, 2007, p. 2). ESCOs recognize the contract tenure in terms of the ceiling limit toward their potential profit. Their share in savings minus their initial investment will not be higher than the allotted energy funding from each federal agency. Statute 42 USC 8287 explains, "Federal agencies may incur obligations pursuant to such contracts to finance energy conservation measures provided guaranteed savings exceed the debt service requirements" (p. 2). This message created a shared understanding within both the government and ESCO parties that the contract should ensure the return of investment. Consequently, for accountability and risk management

purposes, the ESCO's 1) guarantee of savings statement to the agency, 2) risk-management proposal, and 3) established payment schedules should all take into account the principal costs and permanent costs incurred under the contract.

b. Contract Provision 2—Terms and Conditions

It is noteworthy that in the *Energy Policy Act of 1992*, for the development and implementation of ESPC procedures and methods, the Agency Secretary and the Federal Acquisition Regulatory Council are: 1) to establish appropriate procedures and methods for use by Federal agencies to select, monitor, and terminate contracts in accordance with laws governing Federal procurement in a cost-effective manner, and 2) to resolve the existing regulations that are inconsistent with the ESPC intent, and 3) to formulate substitute regulations consistent with laws governing Federal procurement (*Public Law 102-486*, 1992). Furthermore, Statute 42 USC 8287 (Cornell Law School, 2007, p. 4) stresses the sensibility and fairness of a contracting officer as he/she is complying with the *Federal Acquisition Regulation* (*FAR*). The final wording of the ESPC regulation (10 CFR 436 Subpart B with Federal Register as of April 10, 1995) delineates the three most important terms and conditions as follows, in regard to the *ADA* (Department of Energy, 2006b, p. 1):

- Payments would be made to contractors only from funds made available to the agency for energy and related operations and maintenance expenses.
- Third-party financing would permit a financing source to perfect a security interest in the energy efficiency measures used, subject and subordinate to the rights of the federal government.
- Government may consider assigning to the financing source the ESCO's rights and responsibilities under a termination for default.

c. Subparts of S8287

After explaining its ruling authority and fundamental information, the statute breaks into four subparts: A) payment of costs, B) reports C) definitions, and D) acceptance of funds for assisting agencies in achieving energy efficiency in facilities and operations. Part A of S8287 affirms that, "any amount paid by a Federal agency

pursuant to any contract entered into under this subchapter may be paid only from funds appropriated or otherwise made available to the agency for fiscal year 1986, or any fiscal year thereafter for the payment of energy, water, or wastewater treatment expenses" (and related operation and maintenance expenses) (42 USC 8287, 2005, p. 5). Part B states, "Each Federal agency shall periodically furnish the Secretary of Energy with full and complete information on its activities: 1) including the authority provided by this subchapter in its contracting practices; and 2) achieving energy savings under contracts entered into under this subchapter to Congress" (42 USC 8287, 2005, p. 6).

Part C of S8287 defines each specific term with clear definitions, and Part D dictates the assistance to Federal agencies in achieving energy efficiency in Federal facilities and operations:

> The Secretary in fiscal year 1999 and thereafter, shall continue the process begun in fiscal year 1998 of accepting funds from other Federal agencies in return for assisting agencies in achieving energy efficiency in Federal facilities and operations by the use of privately financed, energy savings performance contracts and other private financing mechanisms. (42 USC 8287, 2005, p. 6)

Part D of the 42 USU 8287 fuels the cooperation between the DoE and DoD, accepting funds from each sister department while providing energy efficiency assistance. Using an ESPC's private financing mechanisms, the ESPC recovered funds will continue to be used to administer even greater energy savings and resource efficiency.

D. DoE's Super ESPC Delivery Order Guidelines

Another legislative authority that exempts ESPCs from the *ADA* is from the DoE's Federal Energy Management Program official publication of Super ESPC Delivery Order guidelines (the term "super" signifies umbrella-packaging contracts). An *ADA* issue is the first notable characteristic of the ESPCs. Section 5.1 describes the unique attribute that ESPCs have in government contracting (Department of Energy, 2005, p. 7):

> Anti-deficiency regulations normally require that the funds to pay for contracted services must be obligated before a contractor may perform any work for the government; however, anti-deficiency rules do not apply to ESPCs. Federal agencies may enter into ESPCs with confidence in their ability to make the required payments throughout the term of the contract, because the ESCO guarantees sufficient cost savings to cover project costs. If the guaranteed savings are not realized, the ESCO must reimburse the government for any shortfall.

With this ability, contracting officers, however, are responsible to ensure the first-year funding is allotted. The ESPC-authorizing legislation and regulations specify the first year's funding for performance-period payments needs to be known before awarding an ESPC. Since ESPC awards are targeting energy and other related utility budgets, the estimated annual funding is within the projected Operation and Maintenance (O&M) appropriation. Furthermore, the guidelines suggest that "the funds are obligated not at award, but later, when payments become due after acceptance of an installed project, and when realized project savings are available to make those payments" (Department of Energy, 2005, p. 7). This statement directly sustains the fact that these two unique attributes exempt ESPCs from the *ADA* regulation.

E. Latest Legislative Change

With this background explaining the right of ESPCs to be apart from the regular *ADA* proscription, it is imperative to recognize two other legislative changes that continue to support ESPCs—the first being the provision of House Resolution 6 (entitled *Energy Policy: Comprehensive Energy Legislation in the 109th Congress),* and the second being the extension of the ESPC eligibility period to 2016. These changes are driven by numerous remarkable energy-savings results; for example, in FY2002, 16 Super ESPCs (the term "super" signifies umbrella-packaging contracts) Deliver Orders totaling $97.1 Million were awarded. The cumulative guaranteed cost savings from these projects is estimated to be $783.3 million (Federal Energy Management Program, 2002). Table 1 (Federal Energy Management Advisory Committee, 2005, p. 25) reported Federal ESPC management status and outlined

each department's savings for ESPCs awarded from FY 2000 to FY 2003. Clearly, the DoD contracts yield the largest savings.

			Allocation of project cost savings (thousand $)			
Agency	*Number of delivery orders*	**Project investment value**	Cumulative guaranteed cost savings	Total contract price	Government share of guaranteed cost savings	*Estimated annual energy savings (MMBtu/yr)*
Agriculture	3	$15,823	$39,267	$37,046	$2,221	171,781
Commerce	1	$5,085	$8,690	$8,690	$0	45,767
DOD	154	$1,024,645	$2,220,208	$1,867,998	$352,210	7,260,248
DOE	5	$11,261	$25,357	$24,540	$817	158,144
EPA	1	$4,276	$8,967	$8,688	$279	11,199
GSA	29	$83,977	$214,047	$213,677	$370	996,997
HHS	3	$10,619	$20,033	$20,004	$29	101,400
Interior	3	$10,464	$21,725	$21,533	$192	68,063
Justice	2	$22,373	$43,633	$43,598	$35	84,924
Labor	4	$5,815	$11,602	$11,534	$69	57,515
NASA	8	$8,631	$18,566	$18,520	$46	80,442
National Archives	2	$7,332	$13,169	$13,169	$0	29,247
Nat'l Gallery of Art	1	$2,756	$4,952	$4,927	$25	23,300
State	1	$5,552	$12,848	$12,848	$0	30,750
Transportation	5	$12,237	$45,693	$45,061	$632	89,858
Treasury	1	$3,100	$5,580	$5,580	$0	20,000
USPS	4	$3,834	$9,289	$6,037	$3,252	42,786
VA	36	$87,135	$169,625	$157,365	$12,260	824,902
Total	**263**	**$1,324,915**	**$2,893,251**	**$2,520,815**	**$372,437**	**10,097,323**

Table 1. Investment and Guaranteed Cost Savings for ESPCs Awarded FY 2000-FY 2003

However, the authority status of federal ESPC projects expired on October 1, 2003. According to the research of Federal Energy Management Advisory Committee's (FEMAC's) 2003 estimate, there are more than $300 million worth of projects stalled due to the lapse in authority (Federal Energy Management Advisory Committee, 2005).

1. The Provision of HR6

HR6 of the 109th Congress, the *Energy Policy Act of 2005*, was to enhance energy conservation and research and development, to provide for security and diversity in the energy supply for the American people, as well as serve other purposes. The newest title for HR6 of the 110th Congress is the *Creating Long-term Energy Alternatives (CLEAN) Act of 2007*. This Act is to increase: 1) our nation's energy independence and security, and 2) the production of clean, renewable fuels, and 3) the energy efficiency of products. According to the Congressional Budget Office's (CBO) 2003 cost estimate, the 109th Congress HR6 provisions would increase direct spending by $235 million in 2004, $34 million over the 2004-2008 periods, and about $2 billion over the 2004-2013 periods (Congressional Budget Office, 2003b); unfortunately, the newest 110th Congress HR6 cost estimate is not available at this time. By driving higher efficiency, ESPC Section 1006 then provided the permanent authorization to use ESPCs to 2013. The Congressional Budget Office estimates the provision extension of 10 years would cost $2.8 billion over the next 10 years along with the expected increase usage of ESPCs (Congressional Budget Office, 2003a). Yet, the next amendment to the Act is even more encouraging to the ESPC users because it provides further extension.

2. The Extension of ESPC Eligibility to Year 2016

Section 202 under the Renewable Energy Production Incentive of the *Energy Policy Act of 2005* extended the ESPC eligibility period to October 1, 2016 (this extension also can be found in 42 USC §13317(c) and section 202(c) of the Act). For facilities that generate electricity from landfill gas, it is extended until 2026 if federal funds are available. Another recent ESPC reauthorization amendment in

support of the longest extension can be found in the official publication of DoE, with the heading “The Energy Policy Act of 2005 extended ESPC authority until September 30, 2016” (Department of Energy, 2007a, p. 1). Assistant Secretary for Energy Efficiency and Renewable Energy of DoE, The Honorable Alexander Karsner, confirms that the *Energy Policy Act of 2005,* Section 105, will provide long-term authority to extend Federal ESPCs until the end of FY2016, before the Committee on Energy and Natural Resources of United States Senate on June 22, 2006 (*U.S. Senate Committee on Energy and Natural Resources*, n.d.a.). Another possible extension would depend on the passing of HR671, entitled *Renewable Production Incentive Reform Act,* as Congresswoman Mary Bono of California recommends revisiting and reauthorizing the renewable energy production incentives program until 2023. According to the DoE’s Energy Information Administration Center, the Act was referred to the subcommittee on Energy and Air on February 26, 2003 (EIA, 2007).

F. Summary

This chapter provided the literature review of this ESPC research. Starting with the history of ESPC federal legislation, the chapter referred to the *Energy Policy Act of 1992 (Public Law 102-486)* and *Executive Order 13123* with in-depth legislative documentation support. The chapter also explored an ESPC’s exemption from the parameter of the *ADA* by delving into the statutory interpretation of 42 USC 8287 and the guidance from the Department of Energy specifically for ESPCs. The latest legislative changes and provisions were also discussed in context. This chapter answered the following three research questions: 1) what legislative environment guides the ESPC?, 2) How was the appropriation inconsistency between the *ADA* and ESPC resolved, and 3) what was the enabler for the ESPC? Accordingly, the chapter addresses three main topics: 1) the history of ESPC legislation, 2) ESPC exemptions from the *Anti-deficiency Act,* and 3) lessons learned in terms of how the *ADA* conflict is being resolved, under the current appropriation policy and ESPC legislation. In summary, it is imperative for future policy makers to

make policies that are flexible like ESPCs, which promote the partnership between the Federal and the private sectors. ESPC success is attributed to those judicious policy makers and to the legislative system, which develop effective policies and legislations—such as the ESPC Statute 42 USC 8287 and the DoE's *Super ESPC Delivery Order Guidelines*, which are supported by the enactment of *Energy Policy Act of 1992* (*Public Law 102-486*) and *EO 13123*. These inclusive guiding principles are structured to allow agencies to obligate the government, acquiring energy conservation projects with no initial financial investment. This juxtaposition provides the authority for ESPCs to be exempted from the *ADA*. Without that authority, the funding appropriation conflict for ESPC users would hinder the energy savings development. Without ESPCs' innovative financing mechanism, many agencies may not able to reach their energy consumption goals and, needless to say, the savings they can share with an ESCO. The next chapter will review USAF management structures for its ESPC programs.

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III. The US Air Force and ESPC

A. Introduction

The purpose of this chapter is to provide a comprehensive study of USAF management structures for ESPC programs. At the service level, this paper will focus only on the USAF's ESPC programs, because the USAF has outperformed its energy efficiency requirements and received Presidential-level recognition. As a result of a joint venture between the DoE and the Department of Defense (DoD), the USAF has its own six regional contracting centers for the management of ESPCs. The highly structured roles and responsibilities will be discussed at the four levels: 1) Air Force Civil Engineer Service Agency, 2) USAF Facility Energy Management Team, 3) USAF Regional ESPC center and 4) installation-level management. This discussion will provide a representation of the USAF ESPC management structure.

B. Air Force Civil Engineer Service Agency (AFCESA)

At the service level, the Office of the USAF Installation and Logistic Executive (USAF/ILE) provides the leadership, policies, resources, and oversight to support the USAF mission by supporting its civil engineer team accountable for delivering the highest quality base engineer support. The Air Staff at the ILE level "help commanders acquire, operate, maintain, and protect the installations, facilities, housing, infrastructure, and environment required to support aerospace forces having global reach and global power in peace and war" (Headquarters Air Force Civil Engineer Support Agency, 1999, p. 1). The USAF/ILE is in direct support of the Secretary of the Air Force and Chief of Staff. As the AFCESA directly reports to the USAF/ILE as a field operating agency, the chain of command proceeds from the executive level, the Secretary of the Air Force and Chief of Staff of the Air Force, to the strategic level, the Office of the USAF Civil Engineer, then to the AFCESA, which is the origin of the USAF Regional ESPC. To gain an accurate perspective of how the USAF accomplishes the energy efficiency goal, this project will focus on the AFCESA.

The AFCESA's mission statement envisions providing quality and timely support in contingency, operational, and technical services to the customer. The Air Force Mission Directive 20 designates the AFCESA as responsible to provide USAF Major Commands (MAJCOMs), base civil engineers, and other Air Force and non-Air Force customers specialized capabilities, products, and services to support Civil Engineer (CE) core competencies (Air Force Mission Directive 20, 2002). Under the cross-functioning management, the directorate of Installation Support provides professional engineering and other technical assistance to MAJCOMs and operational bases to "solve complex and unique infrastructure problems, develop modernization plans, reduce energy consumption, and lower rates for utility services" (Air Force Mission Directive 20, 2002).

One of the most relevant of the AFCESA's energy-related activities is the management of the Air Force facility energy program. Other supportive organizations include the Air Force Utility Rates Management Team and the Air Force Utilities Litigation Team; these units specialize in fields of measurements and verification. To capture the performance efficiency and knowledge sharing, Section 5 of the *Air Force Mission Directive 20* provides the AFCESA the authority to have direct communications with the DoE—the super ESPC sponsor, senior state regulatory officials, various Air Staff elements, other government agencies and military services, Air Force commands, agencies, and bases, and industry. This open communication policy promotes the necessary partnering with the DoE, sharing the Department's regional ESPC models that later contribute to structuring the USAF's own six regional ESPC models (Air Force Mission Directive 20, 2002).

Since 1966, the Air Force Civil Engineer Service Agency (AFCESA) has provided the latest methodologies, tools, and now 350 subject-matter professionals supporting USAF civil engineers worldwide, serving as the repository of civil engineering knowledge. Contract management subsists for all six directorates: Business Operations, Contingency Support, Engineering Support, Field Support, Installation Support, and Operations Support (Air Force Civil Engineer Support

Agency, 2007a). Energy-savings policy creation and planning falls in the Utilities Rates Management (URMT) subunit of the Engineering Support directorate. The primary function of the URMT is to provide reasonable price evaluations on the proposed equipment to be installed under ESPCs, which, as a result, helps USAF installations to procure reliable utility service at fair and reasonable pricing. Additionally, the contracting function falls in the arena of the USAF facility energy management team.

C. USAF Facility Energy Management Team (FEMT)

Under procedures for using the USAF Regional Energy Savings Performance Contracts (RESPC), the FEMT is composed of functional experts in civil engineering, utilities, financial management, contracting and legal; its roles include (Air Force Civil Engineer Support Agency, 2006b):

- Minimizing energy consumption and costs by working with energy managers at MAJCOM and installations,
- Ensuring ESPC web-based training is completed by installation contracting and engineering personnel,
- Identifying the authorized local ordering Contracting Officers (CO) to Regional Contracting Officers (RCO), and
- Negotiating price rates on behalf of the Air Force to ensure reliable utility service at a fair and reasonable price.

As one of the leading purchasers of renewable energy in the world, the USAF has been surpassing its targeted energy savings goal since the enactment of the *Public Law 102-486*, the *Energy Policy Act of 1992* and mandates from the *EO 13123*, according to the report on the US Air Force renewable energy program (Air Force Civil Engineer Support Agency, 2007b). Both legislatives are directing agencies to reduce energy consumption by 35% by year 2010, using FY 1985 energy consumption as the comparing base line. Together, the DoD as a whole and the USAF as an individual entity fulfill the *EO 13123*; indeed, both out-performed the goal. The following Table 2 (Doddington, 2005) uses both the DoD's FY 2005 and

the USAF FY 2005 annual energy reports pertinent to their performance of the goal of *EO 131223.*

Annual energy reports pertinent to performance toward the goal of *EO 131223*	**Unit**	**Base Year**	**Previous Year (2004)**	**Current Year (2005)**	**% Change (Current vs. Base)**
Dept of Defense					
Site Energy Efficiency Improvement Goals (Sec. 203) 1990 Base Year	Btu/sq of Ft	136,916	101,557	98,204	-28.3%
Industrial Energy Intensive Facilities Goals (Sec. 202) 1985 Base Year	Btu/unit	213,349	192,399	167,222	-21.6%
Source Energy Use (Sec. 206) 1985 Base Year	BBtu	558,551	428,683	465,121	-16.7%
Water Conservation Goal (Sec. 207) 2000 Base Year	MGal	173,277	146,217	124,292	-28.3%
US Air Force					
Site Energy Efficiency Improvement Goals (Sec. 203) 1990 Base Year	Btu/sq of Ft	156,823	116,470	109,731	-30%
Industrial Energy Intensive Facilities Goals (Sec. 202) 1985 Base Year	Btu/unit	209,550	212,642	197,998	-5.5%
Source Energy Use (Sec. 206) 1985 Base Year	BBtu	197,337	159,995	153,352	-22.3%
Water Conservation Goal (Sec. 207) 2000 Base Year	MGal	51862	41,142	38,113	-26.5%

Table 2. FY 2005 Federal Agency Energy Scorecard

D. USAF Regional ESPC Center (RESPC)

There are three approaches that all Air Force installations use to access ESPCs: 1) through the USAF via the Regional Energy Savings Performance Contracts (RESPC), 2) through individual base-wide contracts, or 3) through the interagency agreement with the DoE's Regional Super ESPCs and Technology-specific ESPCs. The first vehicle yields the highest cost and performance efficiency, as the AFCESA and FEMT perform all the groundwork for the acquisition planning and processes. The RESPCs are created to consolidate USAF energy buys, standardize procedure, and mostly to eliminate duplicating the acquisition effort; "the normal lead time for awarding an ESPC is nine months to one year. The RESPC's reduce the time to get started doing a project to about one month because the up-front solicitation, evaluation, and award are already completed. No additional competition is required to use the regional contract" (Air Force Civil Engineer Support Agency, 2006a). The following figure (Air Force Civil Engineer Support Agency, 2007d) introduces the six USAF RESPCs and the ESCOs within each region.

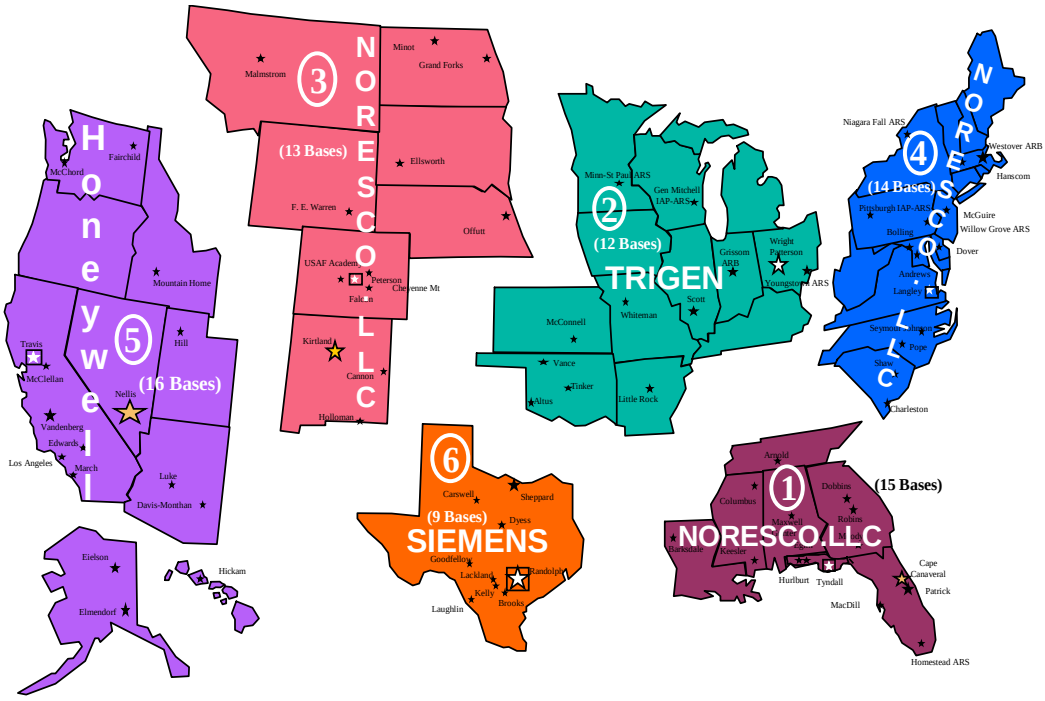

Figure 1. USAF Regional ESPCs

There are six regional ESCOs with six Indefinite Delivery/Indefinite Quantity (IDIQ) contracts available, allowing installation COs to acquire ESPCs in their respective regions. The FEMP supports six Regional Contracting Officers (RCOs) in managing contacts within their respective region and assumes as much of the overhead work associated with administering the RESPC as possible, as "these six 'umbrella' contracts were competitively awarded to ESCOs who demonstrated their capabilities to provide energy projects to federal customers" (Federal Energy Management Program, 2006, p. 1). The general terms and conditions are established in the IDIQ contracts. Under AFCESA RESPC procedures as of April 2006, the associated task orders guidance states, "AFCESA is the facilitator for a base wanting to access an Air Force regional ESPC contract. The RCO will delegate ordering authority to COs within their region after AFCESA coordination. These procedures are applicable for initial acceptance into a RESPC and the issuance of every task order under that ESPC" (Air Force Civil Engineer Support Agency, 2006c). Accordingly, the RCO is the linking pin between the AFCESA and the COs for command, control, and communication purposes, as the AFCESA/FEMT administers the workload of installations' interface needs.

The FEMT provides COs the expertise and objective technical support to assure successful, best-value energy projects. Implementing financially smart, technically excellent, and contractually and legally sound ESPC projects is the motto of the DoE's Federal Energy Management Program. The AFCESA/FEMT furthermore provides "consultation to customers on (ESPC) contracting and financing issues, measurement and verification, and technology and engineering issues" (Federal Energy Management Program, 2006, p. 2). The Government Accountability Office's (GAO) December 2004 report stated the benefit of the DoE's Super ESPC: "Without ESPCs, [Federal] agencies would have to reassess their budget plans to accommodate investments in ECMs and/or Congress would be asked to appropriate funds today to finance investments to meet currently required energy consumption goals" (Federal Energy Management Program, 2006, p. 3). From the USAF perspective and historical performance report, the USAF RESPC

provides the installation a more efficient tool in cost, resource, and mission management.

E. Installation-level Management

After coordinating with the base Civil Engineer and the Contracting Squadron Commander to define and determine the installation's energy needs, the installation CO can: 1) request a delegation of ordering authority from HQ AFCESA, and 2) access a regional ESPC for its IDIQ contract. In general, the base energy manager who is familiar with ESPC concepts and policies would be designated the primary CE POC, whereas the installation CO (who is in charge of the base infrastructure) would be the ESPC leader. Only the delegated and warranted CO can obligate the government and issue or administrate a RESPC task order. ESPC web-based training is the primary tool utilized to educate all ESPC users within the USAF community. The training completion certification and delegated ordering authority's personal information will then be submitted to the RCO for accountability. After signing and accepting delegation of an ordering authority memorandum, the CO can discuss base requirements with the pre-selected ESCO, along with the representative from MAJCOM, AFCESA and CE personnel. The Best Business Practices guidance (in Appendix A) from the AFCESA's RESPC procedures pulls together all the lessons learned for Energy Contract Management (ECM).

The generic ECM has two phases, and the objective for each phrase can be found in the AFCESA RESPC procedures and the associated task orders' guidance. For example, Phrase I activities include the preliminary site survey, applicable wage decisions, breakdowns of rates, milestone or timeline, and the receipt of the Phase I proposal. Accordingly, the government team is responsible for validating the ESCO proposal (Air Force Civil Engineer Support Agency, 2006c, p. 2):

> ESCO's Phase I Report shall only address those buildings/facilities authorized by the CO for a Phase I study [...] the civil engineer reviews and approves the Phase I report, the contracting officer requests authorization from AFCESA/CESM to proceed to Phase II […]

> AFCESA/CESM will review all Phase I Reports and provide review comments to the contracting officer, civil engineer and MAJCOM.

Next, in Phase II, the HQ AFCESA has the decision authority to (Air Force Civil Engineer Support Agency, 2006c, p. 2):

> Notify RCO of potential investment for the task order. In coordination with the RCO, determine if there is sufficient contract capacity to permit the base to proceed to Phase II. Notify requesting installation CO of whether contract capacity is available, and authorize the base to proceed to Phase II.

The informed CO would then direct the ESCO in writing to perform a Phase II—Facility Energy Audit and Economic Analysis. The Phase II review team includes the AFCESA, installation CO and base energy manager. This team is responsible for discussing and negotiating changes as necessary, reviewing reports, and providing inputs to decision-makers. Throughout the lifetime of the contract, the CO has the responsibility to report to Congress if the ESPC cancellation fee exceeds the limit of $10,000,000. The following steps progress after the final negotiation and conclude the roles of the installations' leadership and contracting officer (Air Force Civil Engineer Support Agency, 2006c, p. 2):

> The contracting officer shall submit reports of intent to award an ESPC to the MAJCOM Civil Engineering directorate 45 days prior to contract award. The MAJCOM Civil Engineering directorate shall forward the notification to SAF/AQCK […] A coordination sheet is provided to ensure all appropriate functions have reviewed and coordinated on the task order before the award.

In FY 2006, Defense Components awarded 17 UESC and 19 ESPC task orders/contracts at an award value of $694 Million. Referring back to Table 2, it is projected that this will produce annual energy savings of 1,750 Trillion BTU and a total lifecycle savings of $501 Million. Through Fiscal Year (FY) 2006, the Department of Defense achieved a 5.5-percent decrease in goal facility energy consumption (compared to the 1985 baseline) and a 33-percent decrease in site energy efficiency goal (compared to the 1990 baseline) as compliance to the *EO*

13123. The DoD's FY 2006 Energy Management Report highlighted these outstanding achievements, notwithstanding what the nation is facing now and then: "This was achieved despite increased troop mobilization and training, extensive efforts in fighting the Global War on Terrorism, and response to natural disasters" (Office of Under Secretary of Defense (AT&L), 2007).

Overall, the AFCESA/FEMT and RCO administer the RESPC, which allows installations to accomplish energy projects for their facilities without up-front capital costs and without special Congressional appropriations to pay for the improvements—as the ESCO guarantees that the improvements will generate savings that would exceed the project cost over the term of the contract (maximum 25 years). After the contract ends, the retrofit feature should able to maintain savings measures that continuously accrue to the installation financial resources. By means of the ESPC's innovative financial mechanism, the USAF has exceeded its organizational goal.

F. USAF Success in ESPC

For the third year in a row, the USAF continues to be the leading agency for the Environmental Protection Agency's list of Top 10 federal government green power purchasers in the Green Power Partnership, for completing the largest annual voluntary purchases through December 31, 2006 (Air Force Link, 2007, January 30). While the URMT helps save the USAF millions of dollars annually through rate interventions and contract negotiations with ESCOs, the credit for reaching the consumption goal goes to the FEMT who manages the USAF's facility energy program (Air Force Link, 2007, February). Before the *EO 13123* of June 3, 1999, the FEMT had already responded to 1985 amendment of the *National Energy Conservation Policy Act* (*NECPA*), from *Public Law 95-619* to *99-58*. Table 2 also provides the annual consumption comparison between 2004 and 2005; the USAF is reducing facility energy usage on installations by incorporating energy conservation practices into the daily fabric of the Air Force. "Since that time, the Air Force has reduced energy use by more than 30 million British Thermal Units (MBTU). That's

enough to power more than 20,000 average sized homes for 10 years" (Air Force Civil Engineer Support Agency, 2006b). Furthermore, in the new arena of renewable energy (Sec. 204 of *EO 13123*) self-generation and purchases, the Air Force became the top purchaser of renewable energy in the United States and the third largest purchaser of green power in the world (Air Force Link, 2007, January 30). Compared to FY 2004, the USAF generated and purchased 3680 BBTU of renewable energy, approximately a 220-percent increase (Doddington, 2005). The six USAF RESPCs, as the management components of FEMT, provide the installation-management level an Indefinite Delivery/Indefinite Quantity (ID/IQ) contracts to acquire energy-related services.

G. Summary

This chapter provided a comprehensive study of USAF management structures for ESPC programs. As the USAF has outperformed its energy efficiency requirements and received the Presidential-level recognition, this paper focused only on one of the six USAF's regional ESPCs. The research done on Dyess Air Force Base (Dyess) presented the reader the highly structured roles and responsibilities at four levels: 1) Air Force Civil Engineer Service Agency, 2) USAF Facility Energy Management Team, 3) USAF Regional ESPC center, and 4) installation-level management. Each level of management has its own accountable tasking for centralized supervision and delegation for decentralization purposes. The next chapter will provide the contracting processes review of the research.

IV. Contracting Processes

A. Introduction

The purpose of this chapter is to provide an overview of the contracting processes within the UASF ESPC programs. The research uses the standard contracting processes to review the USAF strategic purchasing strategy toward an Energy Savings Performance Contract (ESPC). The selected example used herein to demonstrate the development, implementation, and supervision of an ESPC is the 2003 Federal Energy and Water Management Presidential award winner Dyess Air Force Base's (Dyess') ESPC. The analysis will focus on the contract process, including: 1) procurement planning, 2) solicitation planning, 3) solicitation, 4) source selection, and 5) contract administration. The contract closeout process will not be reviewed in this research, due to the fact that the contract is still in progression.

Chapter III discussed the six regional ESPCs the Air Force facilities can make use of nationwide in order to streamline their utilities acquirements. For the purpose of the Dyess research, only the Region Six ESPC acquisition process will be discussed in this chapter. The chapter will begin by exploring the process of procurement planning, emphasizing the importance and implementation of strategic purchasing of such energy-service management. The second part of the chapter will elaborate on the solicitation planning, solicitation, and source-selection methods that resulted in Siemens Building Technologies, Inc., being the Region Six contract award winner. Lastly, a discussion of the task ordering and other administrative details will be included in the research. The following diagram provides the visual review of each player for the Dyess' ESPC, starting with organization title, location, and responsibilities.

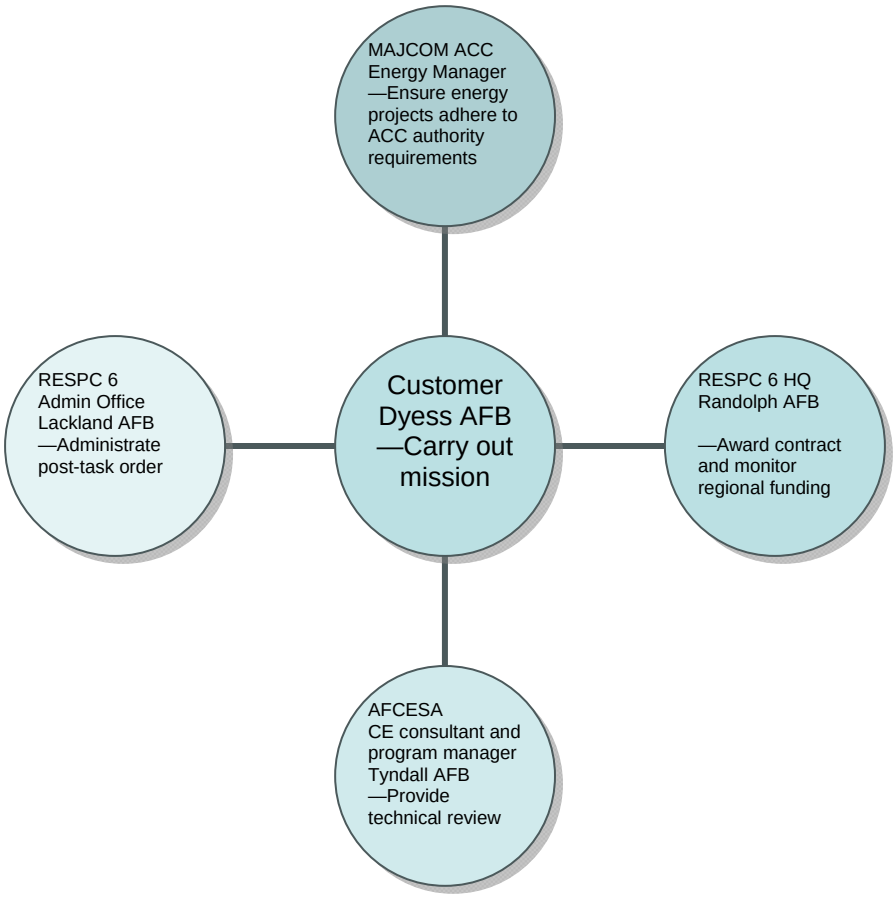

Figure 2. Major Players in Dyess ESPC Contracting Processes

The main decision-making team consists of the MAJCOM energy manager, the installation's energy manager, engineers, and the installation CO. Dyess falls under the major command and control of the Air Combat Command, which has the most influence for decision-making, ensuring the proposed energy projects align with the command mission, regulation, and desire direction. The regional procurement planning responsibility belongs to AFCESA. Chapter III clarifies AFCESA's roles of providing professional engineering and other technical assistance to MAJCOMs and operational bases to solve complex/unique infrastructure problems, develop modernization plans, and reduce energy consumption (Air Force Mission Directive 20, 2002). This chapter describes the contracting processes for the RESPC. Dyess reports its ESPC activities to its RESPC control center at Randolph AFB; this

RESPC center's primary purpose is funding control and performance assurance. At that point, the RCO functions as the primary task order and funding tracker, assigning tracking numbers for budgeting purposes. The USAF planned to utilize regionalized ESPCs, employing the centralized control/decentralized execution approach for its energy service management projects. The USAF is making use of three numerical indicators to govern its energy acquisition system performance status: the RESPC tracking number, dollar amount, and performance period. By controlling these three analytical factors, the DoD and the USAF are both able to achieve their organizational energy consumption strategies while complying with the following orders (Department of Energy, 2007a, p. 1):

- *Energy Policy Act of 2005*: Reduce facility energy use per square foot by 2 percent per year through the end of 2015 or by 20 percent by the end of FY 2015, relative to 2003 baseline, and
- *Executive Order 13423*: Reduce facility energy use per square foot (including industrial and laboratory facilities) by 3 percent per year through the end of 2015 or by 30 percent by the end of FY 2015, relative to 2003 baseline.

The procurement planning process includes requirement determination. For future energy consumption and requirement determination, the USAF first foresees a need to improve an existing capability and, second, a need to exploit an opportunity to reduce cost or enhance performance (Engelbeck, 2002). The fact is, many AFB facilities need recapitalization to operate more efficiently, but the capital for major modernization is not available. For example, the older heating boiler is running up the utility bill compared to the newer, energy-saving heating system. Meanwhile, the maintenance and repair costs continue to increase. Fixing the existing equipment should be the less-conventional option. But if the installation-level management is willing to use an ESPC, the breakthrough result will yield high performance satisfaction.

The USAF planned to manage its energy project through ESPCs in a centralized-control, decentralized-execution manner. Establishing six regional

ESPCs reduced the total procurement lead time. The following table explains the Air Force's contracting strategy and execution planning. Vertically, three rows indicate three levels of management roles and responsibilities; the top row indicates the entire Air Force organization. The second row is the regional HQ center, with Randolph AFB as the center for Region Six. The third row is the operation base level—Dyess AFB for this research. Horizontally, five columns indicate each contracting process, from the beginning of procurement planning to the contract's current state of being administrated. Each box represents each organization's roles and responsibilities to complete RESPC Six functionality. This overlaying matrix distinguishes the roles and responsibility at each level of management, along with each contracting process. The underlying strategy is based on the centralized-control, decentralized-execution theory. That regionalization will yield high performance efficiency and cost reduction, if managed well. Each of the contracting processes will be discussed in detail as it relates to the ESPC program management.

Processes vs. Mgmt Levels and Roles	**Procurement Planning**	**Solicitation Planning**	**Solicitation**	**Source Selection**	**Contract Administration**
1. AFCESA	Regionalization for centralized management	Delegation to the next level	Delegation to the next level	Delegation to the next level	Delegation to the next level
2. RESPC Six	Proceeding from upper level	Templates utilization	Performing	Contract award	Delegation to the next level
3. Dyess AFB	Performing Decentralized management	ESCO Input Phase I Feasibility study Phase II Investment grade audit	—ACC policy review —RESPC Six funding review —AFCESA technical review	Task ordering Phase III Project implementation	Performing by ACO Lackland AFB Phase IV Performance period

Table 3. Air Force ESPC Procedure

B. Procurement Planning

Procurement planning is "the process of identifying which business needs can be best met by procuring products or services outside the organization. This process involves determining whether to procure, how to procure, what to procure, how much to procure, and when to procure" (Rendon & Garrett, 2005, p. 55).

1. AFCESA Level

The making, supplying, and managing of energy are not the core competencies of the USAF, but they are an ESCO's foremost businesses; indeed, energy management is its core competence (Prahalad & Hamel, 1990). The basic functionality of an ESCO would not be to meet the military doctrine and mission, but to make profit by selling its core competence, in the form of products or services. In an economical sense, the USAF is wise to acquire its energy supplies from external suppliers and not try to produce energy itself. After assessing the external market trends, outsourcing is the most practical method for the USAF, because analysis dictates there is neither strategic alignment nor need for the USAF to supply its own energy. This study will discuss three consecutive models and analyses (Kraljic, Cavinato, and AFMC) of sourcing strategies to discover the essence of purchasing energy service management through ESPC programs. The research will define what type of buy acquisition energy service management falls into, and most importantly, what contracting strategy would best fits the USAF's needs. When Kraljic's model (1983), entitled Stages of Purchasing Sophistication, is applied to the USAF ESPC programs, it seems evident that sourcing management is the framework that best fits USAF procurement planning—due to the high market complexity and the low priority level of such purchases. Besides knowing the items and the amount to procure, most importantly, the buyers know what type of relationship they ought to develop. The model helps buyers choose the right relationship to have with the suppliers.

a. Kraljic's Model

This paragraph briefly explains Kraljic's model (see Table 4) for strategic purchasing. The horizontal axis measures the complexity of the supply market,

considering the terms of monopoly or oligopoly, logistics cost and pace of technology. The left indicates the complexity/entry barriers are lower; the right indicates the complexity/entry barriers are higher. The vertical axis measures the importance of purchasing to a particular organization, considering the terms of costing (materials or total), profitability or value-added profile of the key outsourcing component. A lower range indicates the commodity's criticality is lower; the upper range indicates the commodity's leverage power is higher. Additionally, Kraljic (1983) makes note of the changing market, as he explains, "Shifts in supply and demand patterns can alter material's strategic category" (p. 112). When items switch their strategic category from non-critical to bottleneck items, and strategic to leverage items, buyers ought to amend the purchasing plan, swiftly responding to the external environmental change.

	Risk Low	**Risk High**
Profit impact High	Material management for leverage items. Exploitation of purchasing power	Sourcing management for strategic items. Diversify, balance, or exploit
Profit impact Low	Purchase management for non-critical items. Efficient processing	Sourcing management for bottleneck items. Volume assurance

Table 4. The Kraljic purchasing portfolio model
(Kraljic, 1983, p. 124)

Kraljic's (1983) matrix provides four types of guidance on what supplier relationship should exist for each category. "Purchased items are placed in the appropriate quadrant and strategies are developed by quadrant and by specific commodity within a quadrant" (Kraljic, 1983, p. 124):

I) Purchase management for non-critical items that can be obtained locally in short notice of 12 months or less.

Targeting Non-critical items (low market complexity, low importance): purchasing decision-making by lower level (i.e., the operational buyer), required product standardization, efficient processing, and inventory optimization.

II) Material management for leverage items that can be acquired from multiple suppliers and can be obtained within 12 to 24 months.

Targeting Leverage items (low market complexity, high importance): purchasing decision-making by medium level (i.e., the purchasing director), required exploitation of full purchasing power, vendor selection, and pricing negotiation for order-volume optimization.

III) Sourcing management for bottleneck items that incorporate new technology, which may require global sourcing. There will entail tradeoffs between availability and short-term flexibility.

Targeting Bottleneck items (high market complexity, low importance): purchasing decision-making by higher level (i.e., the Dept head), required volume insurance and vendor control.

IV) Supply management for strategic items that can only be obtained through established global suppliers, which require respective contract and risk-management plan implementation to monitor a buy that can last up to ten years. In addition, long-term availability is very important as the key performance criteria.

Targeting Strategic item (high market complexity, high importance): purchasing decision-making by top level (i.e., the Vice President), required accurate demand forecasting, detail market research, risk analysis, contingency planning and logistic control to develop long-term supply relationships.

Having the right ESCO partners is critical to better energy management. Obviously, energy service management is not one of the USAF's areas of expertise. However, leveraging ESCOs' cutting-edge capacity would help all units save more energy. Few energy-related projects/contracts can be considered normal types of Indefinite Delivery/Indefinite Quantity (IDIQ) contracts. Yet, contracting-out the entire USAF energy-related project to a few selected ESCOs does call for a strategic approach for consolidating organization-wide supply management. The ESPC is not a strategic item but a leverage item that requires a strategic approach: planning, regionalized system implementation, and appropriate support. By placing the USAF

ESPC into Kraljic's model, the Air Force would be using material management for leverage items—because although energy has low market complexity, it does have high importance in term of the USAF daily operations. Surely, energy can be acquired from multiple suppliers within a year or two; thus, the USAF strategic purchasing strategy fits well with Kraljic's material management analysis. Table 5 from Cavinato, Flynn, & Kauffman (2006) will introduce different descriptions of four different types of purchases; yet, only one supports purchasing using ESPCs.

High RISK Low	Bottleneck item • Unique specification • Supplier's technology is important • Production-based scarcity • Substitution is difficult • Switching supplier is difficult • Usage fluctuates and is unpredictable	Strategic item • Continuous availability is essential • Custom design, unique specification • Supplier technology is important • Few suppliers with technology capability or capacity • Substitution is difficult • Switching supplier is difficult
	Noncritical item • Standard specification • Substitutes readily available • Competitive supply market: many sources	Leverage item • Standard specification • Volume-price breaks • Substitution is possible • Competitive supply market: several sources
	Low VALUE	High

Table 5. Cavinato, Flynn, & Kauffman's Model

b. Cavinato, Flynn, & Kauffman's Model

According to Cavinato, Flynn and Kauffman's (2006) model, supply management provides the best strategy option based on the following two consecutive evaluations. First, an ESPC falls under the procurement of services. The USAF is trying to contract with an ESCO to leverage its modernized market capability. Due to the fact that energy management is the core competency of ESCOs, they have the technology, capability, and qualification to meet the market requirement. As suppliers differentiate through non-price attributes, an ESPC requires strategic approaches. For instance, the USAF would benefit from leveraging the ESCOs' industrial capacity and capability for energy service management. Cavinato et al., (2006) explain that leverage items call for sourcing management:

> Noncritical and leverage purchases are standard goods and services that are low to medium risk to acquire. There are multiple suppliers, quality is comparable, substitutes are available, and market forces keep prices competitive […] Higher volume (leverage quadrant) gives the buying organization power in the marketplace, so supply strategies focus on leveraging volume and scale and reducing the supply base. (p. 124)

Now, the research will utilize the four distinguishing characteristics for leverage items as the second evaluation criteria to examine if an ESPC fits the following description:

- Standard specification or "commodity" type of items:

Analysis: An ESPC is a commodity/mixed-services type of contract that requires the standard specification, as well as the additional capability to integrate all elements such as supply, demand, facility operation, savings measurement and auditing, design-build capability, and alternate financing opportunities. In this research, ESCO Siemens is equipped to deliver such a full range of strategic energy services.

- Volume-price breaks:

Analysis: with RESPC Six, Siemens has nine USAF facilities with which to contract. The volume-price break apparently is not about the 9 bases or their potential projects volume, but concerns the conservation, measurement, and verification of savings. In an ESPC, the more savings through the contract, the higher return for the ESCO. The more efficient the energy management

system, the less electricity or utility unit resources the government will consume, which contributes to lower cost and expenses.

- Substitution type of contract:

Analysis: substitution is possible and available, especially when the project requires minimal maintenance or repair of an aged utility system. When the low budget would not allow buyers to change an entire energy infrastructure, substitutions only provide a temporary solution. The saying, "If it ain't broke, don't fix it" would apply better if the current system best fit the current need. Sourcing management means the market has enough suppliers; it is, therefore, not difficult to switch suppliers. However, the reader may recall that ESPCs are long-term contracts, encompassing a maximum of 25 years. While planning how to procure such leverage items, the procurement team may consult upper organization for policy alignment and agreement.

- Competitive supply market: number of sources type of contract:

Analysis: Siemens is one of the four ESCOs with whom the USAF contracted for energy services. The other three high-capability competitors are Trigen, Honeywell, and Noresco LLC. From the data collection, there are 15 responding bidders for RESPC Six solicitation, although not all proposals are responsive to meet the government requirement. One can presume that the supply market is competitive, including prime contractors and subcontractors.

Using the Cavinato et al., (2006) model, it's clear that energy management service is a leverage item that can be fulfilled by several sources. Both the Kraljic's (1983) sourcing strategy portfolio and the Cavinato et al., (2006) approach for leverage items require purchasing directors to pay close attention to: building effective relationships with suppliers, acquiring full system support (primarily internally), as well as organizing a group of skilled staff as the key team players. The following will discuss Air Force Material Command sourcing strategies, customized for unique organizational procurements.

c. Air Force Material Command Sourcing Strategies

One of the USAF Material Command (AFMC) Logistics and Sustainment initiatives is the Expeditionary Logistics for the 21st Century (eLog21). "eLog 21 is an overarching Logistics Transformation Campaign Plan that strives to improve and expedite USAF logistics by prioritizing and categorizing current and future initiatives

while ensuring those with the highest payback are identified. […] Key enablers include people, financial resources, and infrastructure" (*Joint service best business practices*, 2006, p. 1). The two enablers for this initiative are the Purchasing & Supply-chain Management (PSCM) and Product Support Campaign (PSC). Among them, the PSCM initiative utilized sourcing strategies, working with customers and suppliers to maximize procurement performance. "PSCM leverages collaborative efforts with industry to link supply chain management processes to create more effective and efficient supply chain integration" (*Joint service best business practices,* 2006, p. 1).

Overall, PSCM is employed to upgrade the functionality of traditional purchasing, to insure the supply processes is most effective, and to reduce supply-chain operating costs. Meyer (2006) commented on the USAF's transformation initiative PSCM as "the process of significantly changing the way it purchases goods and services with the goals of reducing costs and increasing performance to better support its missions. This and it represents the most significant change in Air Force Materiel Command (AFMC) supply and purchasing operations in the past 40 years" (p. 1). To improve their end-users' supportability, buyers need to learn how to identify the type of commodity the USAF is procuring so the procurement teams are able to match the procurement with the appropriate strategies and management, and are better able to manage the sourcing relationship. Similar to Kraljic's matrix, the AFMC has its organizational sourcing strategies matrix, adapted by Hudgens (2007) from HQ AFMC/PK as the following:

High RISK (Source & Availability) Low	<u>Bottleneck Items</u> Type of Items: Low MTBF Sourcing Strategies: • Replace/Redesign, Reverse Eng. • Find New Sources • Improve Reliability Type Contracts: • Cost-plus, Performance-based	<u>Critical Items</u> Type of Items: Expensive and High Paid (i.e., Engines, Electronics) Sourcing Strategies: • Long-term Relationships • Increased Supplier Roles • EDI/Wed-enabled Co-forecasting Type Contracts: • Corporate Contracts w/ Incentives • Award Fee/Term
	<u>Non-Critical Items</u> Type Items: Bench Stock/Indirect Sourcing Strategies: • Minimize Transaction Costs (i.e., GPC, Automate, E-business, etc.) • Standardize where Possible Type Contracts: • Purchase Orders	<u>Leverage Items</u> Type Items: High MTBF and $$ Sourcing Strategies: • Make Use of Competition • Conclude Long-term Buying Arrangements w/the Best Suppliers Type Contracts: • IDIQ, Award Fee/Term
Low	VALUE (Spend & Revenue)	High

Table 6. AFMC Sourcing Strategies Matrix

The first sourcing strategy challenge is to decide whether an ESPC really fits the qualification of a leverage item. By applying Hudgens' (2007) model to ESPCs, the research confirms that ESPCs are best managed as a leverage item—when based on the following analysis:

- An ESPC is considered a high-dollar-amount procurement, as "CBO estimates that the reauthorization of ESPCs would increase direct spending by $256 million in 2007 and $2.9 billion over the 2007-2015 period" (Congressional Budget Office, 2005, p. 1). However, that is the estimated total spending as a nation. Using Dyess as a smaller-scale user of ESPCs, its latest task ordering number 3 acknowledged the fact that ESCO Siemens has a capital Investment of $2,200,978, which requires an annual payment from the government of $257,931.72, effective as of March 2002 to March 2017. According to the *Federal Acquisition Regulation* (*FAR*), procurement amounts over $100,000 would be considered high-dollar amounts. An ESPC's Mean Time between Failures (MTBF) should be high, considering that most energy fixtures are designed, built, and tested to last. Additionally, Siemens claims to "understand that virtually every facet of enterprise performance is impacted by energy: profitability, productivity, quality, customer satisfaction, competitiveness, and environmental responsibility." Indeed, its past performance record is as follows (Siemens, 2007, p. 1):
    - More than 110 years in business—over $1 billion in guaranteed savings.
    - Over $3 Billion experience in negotiating energy contracts.
    - Number 1 customer satisfaction rating.
    - More than 140 US locations to serve customers' needs locally.
    - Global leadership, with over $70 billion in sales volume.
- An energy project procuring an energy management system would not likely fall under the simplified acquisition thresholds of $25, 000, according to the *FAR*. Thus, the use of competition is mandated by law; in particular, compliance to the *Competition in Contracting Act of 1984* is required. Furthermore, the possibility that energy system procurement falls into the circumstances that permit other than full and open competition is very low. Referencing *FAR* 6.302, here are the allowable circumstances:
    - Only one responsible source and no other supplies or services which satisfy agency requirements.
    - Unusual and compelling urgency.
    - Industrial mobilization; engineering, developmental, or research capability; or expert services.

- International agreement.
- Authorized or required by statute.
- National security.
- Public interest.

- Long-term buying requires buyers to reflect on the opportunity to build a partnership/relationship with the suppliers. The goal should be a true win-win situation—in which both the government and the supplier will grow and benefit from the contract. According to the CBO's estimate, "Under current law, contract terms can go up to 25 years. The average ESPC contract term is 17 years" (Congressional Budget Office, 2005, p. 1).
- ESPCs fall in the IDIQ type of contract. Award fees based on a higher savings/profit-sharing ratio provide incentives for an ESCO to take on more energy savings strategies.

2. Regional ESPC Level and Operational Level

As a result of the USAF's strategic approach of regionalization, centralized control, and decentralized execution to energy management, there is no procurement conducted at the regional and operational level.

C. Solicitation Planning

Solicitation planning is "the process of preparing the documents needed to support the solicitation. This process involves documenting program requirements and identifying potential sources" (Rendon & Garrett, 2005, p. 55). This process is conducted by the regional ESPC CO.

1. AFCESA Level

There is no solicitation planning at this level, as a result of the USAF's strategic approach of regionalization, centralized control, and decentralized execution to energy management. Planning was delegated to the next lower level, regional ESPC.

2. Regional ESPC Level

The USAF segregates its nationwide facilities into six regions for the purpose of centralized control and decentralized execution of RESPCs. Unified training is given to each regional ESPC team; this team consists of the regional COs, energy managers, and other ESPC administrators. The team is provided many standardized templates as a method of standardizing the process. The templates include the regulation and uniform functionality: 1) ensuring every RCO has the right template to post a regionalized solicitation, and 2) using a small-scale, energy-related project to assess each proposal, so each RCO and team can evaluate each ESCO's performance capability in a consistent manner. The goal of the RCO is to plan and insure that the solicitation will align with the Headquarters AFCESA's guiding requirements, as it should fit all facilities in a general sense and not be vague or conflicting. Overall, the solicitation planning yields a standardized result, so that each RESPC has one pre-selected ESCO for providing the energy service management within that region.

3. Operational Level

Solicitation planning at this lowest level has a different definition. Presumably at this point, an ESCO is being selected to service the particular region. For example, ESCO Siemens was awarded the Region Six ESPC on November 6, 1998. From that day forward, bases within Region Six have the IDIQ accessibility to issue task orders from RESPC Six, because once the RCO issued the Decentralized Ordering Authority letter to the installation's CO, the base has the responsibility for all contracting actions related to awarding, administering and closing out the task order issued under the regional ESPC contract. Subsequently, the Wing involvement/review/approval process for an ESPC task order at a base is the same for any regular contract/task order issued. The implementation of energy conservation and efficiency improvements follows a four-phased program that consists of: 1) Phase I— Preliminary Site Survey for feasibility study, 2) Phase II— Facility energy audit, economic analysis, and investment-grade auditing, 3) Phase

III—Project Implementation (design, engineering, equipment procurement, financing, and installation) and Operation/Maintenance, and 4) Phase IV—Performance Period.

There is no official solicitation planning at the operational level; however, the Dyess ESPC team did perform the first two phases of the program—which is a partnership with Siemens for best requirements determination—within the budget constraints. The Integrated Project Team (IPT) included: 1) the government personnel, with knowledge of their mission, federal regulation, budget, and physical assets, and 2) the ESCO personnel, with knowledge of the industry, latest technology, conventional design, and business expertise. The IPT should consider both short- and long-term proposals, goals, and the possibility of progressive construction, which is building the open-ended modular foundation, allowing future expansion. The IPT should provide the best value application under the current budget constraint.

Notably, the Presidential Award of 2002 recognized the collaborative and unified relationship between Siemens and Dyess. The joint venture helped Siemens to shorten the learning curve, lower the total costs, and allow both parties to benefit from the savings. Dyess' IPT consisted of the base energy manager and the contract enabler, an experienced team very familiar with the base mission requirement. It has the base background information in detail, from each unit to each layout of the facilities, along with all existing military specified regulations. The Siemens-Dyess team lead was the Technical Services Manager. The IPT brought to the table the latest technology and capacities to measure and verify the energy savings after Dyess's buildings upgrade. Attachment A provides an example of the first two phases under two Contract Line Items (CLIN).

Financial obligation is clear under the *Federal Acquisition Regulation* (*FAR*) Uniform Contract Form Part I, section B, for suppliers or services pricing or costing data, stating that Phase I and Phase II may be directed by letter, but the work shall not be separately priced (Solicitation document, 1997, p. 4):

> NOTE: Phase I and II work shall not be separately priced, the ESCO will bear the costs of performing Phase I and II works and may recover that cost ONLY if the work proceeds to Phase III. If the work proceeds to Phase III, the cost for Phase I and II work will be negotiated and paid from savings.

Furthermore, there is no guarantee to the ESCO of any firm-fixed price task ordering, which significantly increases risk to the ESCO (Solicitation document, 1997, p. 16):

> NOTE: This is an Indefinite Delivery Indefinite Quantity (IDIQ) contract and as such there are no guarantees the Government will issue contract task orders in any amount at any time beyond the guaranteed minimum which will be awarded concurrent with contract award; however, it is the intent of the Government to take advantage of this contract to accomplish energy conservation and infrastructure modernization work, which may result in the issuance of contract task orders.

Lastly, additional financial reporting requirements are as follows (Air Force Civil Engineer Support Agency, 2006c, p. 3):

> NOTE: Submit a memorandum (as early in the negotiation process as possible) according to Attachment 4 for Congressional notification if cancellation costs could exceed $750,000. After the notification period is complete (SAF/AQCO memo says 45 days), and the civil engineers have accepted the Phase II Report/proposal, issue the contract task order for Phase III work.

D. Solicitation

Solicitation is the process of obtaining information, either though Invitation for Bids (IFB) or Request for Proposal (RFP), from prospective sellers for the products or services supplies. At the end of the process, buyers should have a clear understanding of how the sellers can fulfill the requirement.

1. AFCESA Level

There is no solicitation at this level, as a result of the USAF's strategic approach of regionalization, centralized control, and decentralized execution to energy management. Solicitation procedures were delegated to the next lower level.

2. Regional ESPC Level

Randolph AFB, Headquarter of Air Education and Training Command, Contracting Squadron, is the authorized ESPC office for Region Six, and was responsible for drafting the award synopsis and solicitation and for awarding the selected contract. The original CO started and finished the RESPC Six project. While sharing a great depth of ESPC knowledge and using appropriate templates from AFCESA, she is the expert on USAF contracting practices.

a. The Synopsis

On June 19, 1997, and under the title of Pre-qualified sources sought for energy-savings performance contract opportunity, the solicitation synopsis hardcopy was posted in the Commerce Business Daily (currently replaced by the FedBizOpps website—the single government point-of-entry for Federal government procurement opportunities within the specified dollar threshold). Interested ESCOs were given 15 days to respond to the RCO, confirming that they were preparing to summit a proposal. The solicitation was then only sent to the eleven interested ESCOs.

b. Solicitation Contents

Adhering to the *FAR* 15.204-1 Uniform Contract Format, the solicitation had four sections and twelve subsections (Highlighted in Attachment C). More supplementary sections of the solicitation will be discussed in the next few contracting processes.

3. Operational Level

After Phase I and II were completed, the reports were reviewed by:

- MAJCOM Air Mobility Command, for command policy review

- AFCESA for technicality review and other civil engineering review
- RESPC for funding review, to ensure the project will not exceed the regional overall budget.

E. Source selection

Source selection is "the process of receiving bids or proposals and applying evaluation criteria to select a provider" (Rendon & Garrett, 2005, p. 55). In this research, the offers were evaluated based on four factors: Technical, Management, Financial, and Subcontracting plans. Among all factors, the Technical Factor weighed the most.

1. AFCESA Level

There was no source selection for contract award or task order process at this level, as a result of the USAF's strategic approach of regionalization, centralized control, and decentralized execution to energy management. These activities were delegated to the next regional level.

2. Regional ESPC Level

a. Section L and M of Part IV of the Solicitation

The source selection was conducted using the evaluating criteria within Section L & M of the solicitation, which also provided the submittal instructions. For example, for the research case, there is a font and size limitation for the proposal, but no page limitation. However, Section L of Part IV of the solicitation details the proposal preparation information. It identifies the standardized format and contents supporting the source selection criteria within three volumes (Solicitation document, 1997, p. 77):

Volume I—Technical, Project Management, and Financial Plan

Volume II—Subcontracting Plan

Volume III—Completed RFP (Sections A-K)

According to the data obtained, source-selection information received from respondents was sensitive and contained proprietary information that prevent it from being circulated; the only available information for this study was the selection criteria in the solicitation document. Section M of Part IV of the solicitation contains the evaluation factors for award information. For the purposes of award, offers were evaluated based on the following factors (Solicitation document, 1997, p. 79):

- Technical,
- Management,
- Financial, and
- Subcontracting Plan.

The ranking of importance for each criterion is (Solicitation document, 1997, p. 79):

- The Technical factor is most important.
- The Management and Financial factors are of equal importance to each other, and both are somewhat less important than the Technical factor.
- The Subcontracting Plan factor is least important and is somewhat less important than the Management and Financial factors.

Note: RESPC Six did utilize a Government Evaluation Board that was mentioned in the solicitation. According to the data mined, the RESPC Six evaluation board had two pricing specialists for financial evaluation. The Government evaluation team evaluated the proposals for compliance with Section L, Instructions to Offerors, and Section J, Attachment 1, Format for Seed Project, and each proposal was evaluated by comparison to the standards (Solicitation document, 1997, p. 80).

b. Evaluation Factors and Subfactors

RESPC Six was awarded to Siemens for being a responsible offeror that presented the evaluation board the most advantageous Energy Conservation Project

(ECP) proposal for the seed project. Among eleven competitors, Siemens demonstrated a clear understanding of the ESPC concept and contract requirements, and provided detailed evidence of its ability to meet those requirements in a timely and cost-effective manner (Solicitation document, 1997) as it satisfied the following evaluation factors and subfactors:

- Technical Factor

  The Technical factor includes the six subfactors: 1) Measure &Verification (M&V), 2) Baselines, 3) O&M, 4) Energy Audits, 5) Design, and 6) Implementation. The contractor's overall Technical approach will be reviewed by evaluating and color-rating each of the technical subfactors.

- Management Factor

  The Management factor includes subfactors: 1) Project Management Plan and Subcontractor Management Plan, and both will be evaluated and color-rated.

- Financial Factor

  The Financial factor was not rated with the color scale. The Financial section evaluates the Seed Project cost to ensure reasonableness, realism, and completeness. The Total Seed Project Cost Evaluation employs the Energy Prices and Discount Factors for Lifecycle-cost Analysis, Savings to Investment Ratio Analysis, and Internal Rate of Return Analysis.

- Subcontracting Plan

  The Subcontracting Plan factor was not rated with the color scale; however, it will be evaluated to ensure compliance with Provision L-1003b, Volume II—Subcontracting Plan, and *FAR* clause 52.219-9.

C. Evaluation Ratings

There were two parts to the evaluation rating, color-rating and risk-rating. Only the subfactors for the Technical and Management factors were given a color-rating, and the subfactor color-ratings were then combined into an overall color-rating for each factor, according to the following Table 7 (Solicitation document, 1997):

BLUE Essentially outstanding in all respects; innovative, comprehensive, and complete in all details; meets or exceeds all requirements and objectives. Many significant strengths and no significant weaknesses.
GREEN Meets requirements, but may lack some minor details. May have some strengths, but generally has no significant weaknesses.
YELLOW Unacceptable as submitted, but capable of being made acceptable. Proposal lacks essential data to substantiate the information presented, although the offeror may be able to meet the requirements. Significant weaknesses outweigh the strengths, but appear to be correctable through reasonable discussions.
RED Unacceptable and incapable of being made acceptable without major revisions to the proposal. Proposal displays a lack of understanding of the Air Force ESPC Program, lacks significant details, or fails to meet requirements of the RFP. Proposal lacks essential information and/or is conflicting and unproductive. Many significant weaknesses. There is no reasonable likelihood of success.

Table 7. Color-rating for Technical and Management Factors

The next rating identified the risks associated with the offeror's proposed approach as it relates to accomplishing the initial energy savings project under this contract. The Technical and Management subfactors were given a risk rating and then be combined for an overall risk rating for each factor, according to the following, Table 8 (Solicitation document, 1997):

LOW There is a low risk that the offeror would fail to meet the contract requirements or proposed performance guarantees. There is little potential to cause implementation schedule disruption, mission or equipment performance degradation, or failing to achieve proposed energy savings. Normal ESPC monitoring procedures by contractor and Government personnel will likely overcome difficulties.
MODERATE There is a moderate risk that the offeror would fail to meet the contract requirements or proposed performance guarantees. There is some potential for implementation delays, mission or equipment performance degradation, or failing to achieve proposed energy savings. However, contractor personnel qualifications, special contractor emphasis, and close Government monitoring will likely overcome difficulties.
HIGH There is a high risk that the offeror would fail to meet the contract requirements or proposed performance guarantees. There is a likely potential for significant implementation delays, mission or equipment performance degradation, or failing to achieve proposed energy savings even with contractor personnel qualifications, special contractor emphasis, and close Government monitoring.

Table 8. Risk Rating

d. RESPC Awarded

USAF Region Six ESPC was awarded to Siemens Building Technologies, Inc., in November 1998, and was assigned contract number F41689-99-D-0500. All bases within Region Six were allowed to utilize this ESPC IDIQ contract for issuing energy-related task orders, assuming compliance of other USAF organizational or command-associated requirements. For example, one of the related requirements and limitations is that prior to receiving approval for the RCO to use the contract, the operational-level users must request authorization to use the contract, in accordance with AFCESA ESPC training and authorization requirements.

After the interested local CO requests HQ AFCESA permission to utilize the RESPC, there are still two critical requirements before the contract utilization. The

first requirement is that HQ AFCESA would train, select, and authorize the qualified local contracting officer and inform the RCO to begin the appropriated delegation procedures. The second requirement is that the RCO must send the delegating ordering authority memorandum indicating the appointment of a decentralized ordering officer to the local CA, under the responsiveness of HQ AFCESA. The finished product, RESPC Six, aligns with its procurement planning (by means of the regional decentralized approach to managing its energy projects) to strategically make use of three controlling markers to govern the acquisition system: RESPC tracking number, dollar amount, and performance period.

3. Operational Level

There is no official source selection at this level, as a result of the USAF's strategic approach of regionalization, centralized control, and decentralized execution to energy management. After completion, the pre-selected ESCO Siemens will finalize the task orders so it can proceed to Phase III for project implementation. See Attachment B for a description of the CLIN 0003 Energy Conservation Measures (ECMs) implementation, operation, and maintenance.

F. Contract Administration

Contract administration, as explained previously, is "the process of ensuring that each party's performance meets contractual requirements" (Rendon & Garrett, 2005, p. 55). For this research, there are three levels of administrative duties, and the Dyess ESPC's administrative CO is at another base, the Lackland AFB.

1. AFCESA Level and Regional ESPC Level

As a result of the USAF's strategic approach of regionalization, centralized control and decentralized execution to energy management, the administrative duty at this level is decentralized. Some of the contract administration is centralized at the AFCESA, and other parts of the contract administration are decentralized at the actual installation. This energy acquisition system utilizes three controlling

performance measurements to administer its ESPCs effectively: RESPC tracking number, dollar amount, and performance period.

2. Operational Level

The following, Figure 3 (Air Force Civil Engineer Support Agency, 2007d), illustrates a typical ESPC project-supporting system, in which there is strong partnership between the Contracting Squadron and the Civil Engineering Squadron, along with the financial and legal supports. The Contracting Squadron consists of the CO and administrative support. The Civil Engineering Squadron consists of the base energy manager, ESPC supporting design engineers, construction oversight support and the shop itself.

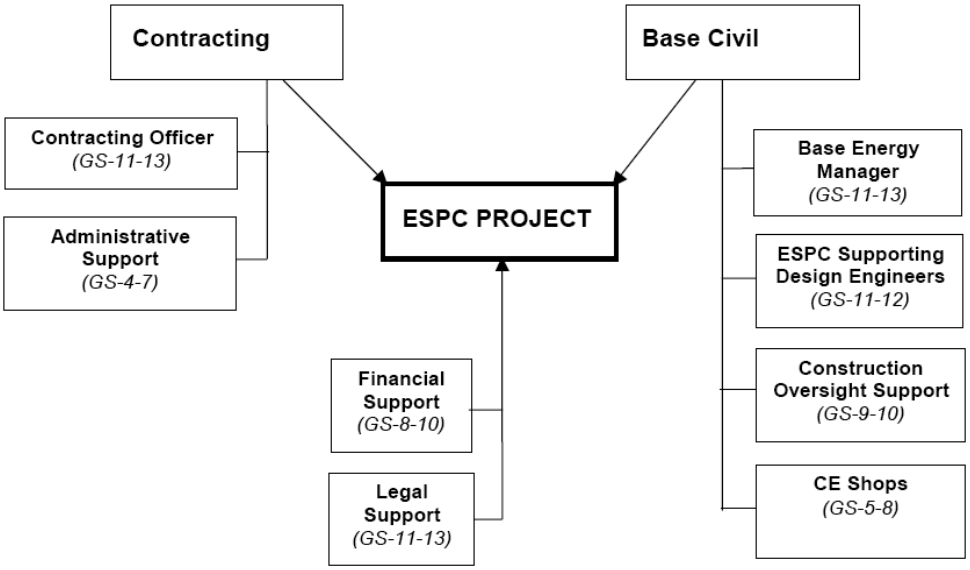

Figure 3. Typical USAF Base ESPC Project Support Chart

As a result of the USAF's strategic approach of regionalization of centralized control and decentralized execution to energy management, the contract administration duty at this level was delegated to the Administrating Contracting Office (ACO) at Lackland AFB, TX. As Phase IV Performance Period is a continuous project, the ACO is responsible for contract modification, billing matters,

and other administrative issues, whereas the Dyess IPT is responsible for quality control, inspection and acceptance of product or services, and other on-site issues. To administer effectively, this energy acquisition system utilizes three controlling performance measurements: RESPC tracking number, dollar amount, and performance period. Dyess is required to report these three types of information to the RCO for regional funding and progress accountability.

Procurement planning for the US Air Force is very extensive; it is impractical to have one ESCO control a large share of market. Therefore, the USAF has six regional contracts with different ESCOs to offer more competition. The purpose of having one regional ESPC with one pre-selected ESCO is to provide all Air Force installations located in Region Six a negotiated contract (Solicitation document, 1997, p. 3). Selecting and sourcing reliable ESCOs for such a large organization required the AFCESA to have a strategic supply management system, and the framework of a RESPC is the result of procurement planning. As part of the AFCESA's Strategic Business Plan, the regionalization is created to streamline the Air Force's energy purchasing processes and build consensus among each MAJCOM's doctrine, policies, and practices, while partnering with Office of Secretary of Defense, Air Staff, Joint staffs, other sister services, and allies (AFCESA, 2007e).

The regionalization environment is designed to streamline the entire organizational process. The ultimate goal is to allow operational-level users to acquire energy management systems at the lowest cost and shortest lead-time possible. The chapter provided a basic review of how a regionalized strategic purchasing management is conducted, and how each level of functionality plays its part to make Dyess' ESPC possible. From the USAF level to the RESPC, from installation level management to the ACO, each unit plays a vital role in the success of an ESPC. Regionalization is the purchasing strategy in this case. The leveraging of an ESCOs' core competency and its competitive edge was thoroughly assessed by the source-selection process. An excerpt from the Defense Acquisition University

publication (Meyer, 2006) entitled *New Skills for Contracting in a Strategic Environment* summarizes and explains the guidance for the transformation of Purchasing and Supply-chain Management (PSCM) for USAF energy procurement (PSCM Article, 2003, p. 2):

> This (PSCM) transformation initiative is applying leading practices from the public and private sectors and based on achievements of leading commercial firms, the results will be significant. Commercial firms adopting streamlined supply chain management practices have realized significant reductions in supply chain costs, improvement in delivery responsiveness, and increases in quality of goods and services.

Ultimately, an ESPC is a tool for regionalization and for better purchasing and supply-chain management.

G. Summary

This chapter provides a discussion for the Dyess ESPC program contracting processes. As the three assessing models validate that an ESPC best fits as a leverage item, the research uses the standard contracting processes to review the USAF contracting approach toward this leverage item. This chapter also explored the three main management levels that the USAF uses to manage its ESPC projects, as well as the five standard contracting processes that intermingle within those levels. The Dyess ESPC solicitation documents presented all three Contract Line Items, the evaluation factors for source selection, and the rating description for evaluation purposes. The contract closeout process was not mentioned in this research, due to the fact that the contract is still in progress. Chapter V will summarize the research, presenting conclusions and further research opportunities.

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V. Summary, Conclusion, and Recommendations for Further Research

A. Summary

The purpose of this research is to explore the use of Energy Savings Performance Contracts (ESCP) within the DoD, focusing on the USAF energy management system. The significant value of the ESPC is its alternative financing mechanism that authorizes and facilitates Federal facilities recapitalization without up-front investments. By presenting the *Energy Policy Act of 1992 (Public Law 102-486)* and *Executive Order 13123* in an in-depth legislative review, the research answered the following questions: 1) What legislative environment guides the ESPC? and 2) How was the appropriation inconsistency between the *ADA* and ESPC resolved? The research provided a comprehensive study of USAF management structures for an ESPC, while focusing only on one of the six USAF's regional ESPCs, Dyess Air Force Base's (Dyess') ESPC. It also presented the highly structured organizational roles and responsibilities at four distinguish levels: 1) At the Air Force Civil Engineer Service Agency, 2) USAF Facility Energy Management Team, 3) USAF Regional ESPC center and 4) installation-level management. Each level of management has its own accountable tasking for centralized supervision and delegation for decentralization purposes. With the application of five of the six phases of the contracting processes: 1) procurement planning, 2) solicitation planning, 3) solicitation, 4) source selection, and 5) contract administration, the research provided an analysis of how the USAF contracts its energy management system. The RESPC Six's first ESPC energy project (valued $250,000) involved lighting retrofits to improve air flow in three facilities at Lackland AFB. Later, using the same regional ESPC, Dyess AFB was able to renew its aging infrastructure, which currently results in less equipment failure and lower utility bills. This research presented a comprehensive presentation of the entire contracting process for USAF energy projects and systems.

B. Conclusion

Based on the data gathered, the researcher has four conclusions in regards to the best practice ESPC characteristics. The first conclusion is that the USAF's energy management approach, due to the use of the ESPC and its innovative financial mechanism, was successful. The organization is large; yet, it was swift in meeting the legislative requirements, exceeding its energy savings goal, and has now become one of the nation's ESPC leaders.

The second conclusion is that the USAF's policy of centralized control and decentralized execution toward its energy management structure was effective. Each level of management has clear roles and responsibilities. Because of this organization, the delegation of authority between the three levels works effectively. The highly structured roles and responsibilities exist on four distinguished levels: 1) the Air Force Civil Engineer Service Agency, 2) USAF Facility Energy Management Team, 3) USAF Regional ESPC center and 4) installation-level management. This management structure successfully facilitates the organization's energy supply management strategy: centralized control and decentralized execution.

The third conclusion is that the USAF's use of ESPCs to acquire energy projects and its management system is innovative, and it can still be analyzed by applying the six-phased contracting process. Those processes were effectively intermingled with the four levels of management teams. Each contracting phase at each level of management presents a different level of tasking. The collective tasking at the centralized level, i.e., the procurement planning, solicitation planning, solicitation, and source selection consolidation efforts produce five regional IDIQ ESPCs.

The fourth conclusion is that, in order for an ESPC to be successful, both the collaboration effort and communication must exist between: 1) all three management levels, 2) installation Contracting Squadron (CONS), Civil Engineering Squadron (CE), Judge Advocate General (JAG), Finance Squadron (FM), and 3) the

partnerships with ESCO Siemens, Inc. This cooperation between all agents is critical to the success of the ESPC programs. As time, cost, and resources savings are tremendously valuable to the USAF mission requirements, Dyess was able to acquire energy management systems at the lowest cost and shortest lead-time. Dyess was shown to be an energy management leader for facilitating all four of these value-added concluding factors within its purchasing environment.

C. Recommendations for Further Research

From a broad view, at the national public policy level, we observed what conservation measurements are used for efficiency. At the mid-level, the research focused on organization energy management system structures. And at the operational level, this study refined the scope and examined a comprehensive contracting process. In addition, this research explored the implications of using a regionalized, ESPC-based approach on the contracting process, focusing on five phases of that process; it also identified the best practices and characteristics of that approach. Based on the conclusions, the following are areas for further research:

1. ESPC Application in Other DoD Departments

Other research can be done to assess other USAF installations' ESPC performance and to study their energy management structures. Further investigation can explore the status of other ESPCs in the USAF and how implementation has proceeded. Differences between the five regional ESPC IDIQs can also be discovered by investigating each contracting process for each contract. From a broader perspective, other research can be done to examine how the DoD's military services (Navy, Army, and Marine Corp) fulfill their energy needs, and what purchasing or management strategies they implement. Such research could discover if they implement any regionalized IDIQ contracts or some sort of centralized control/decentralized execution methodology. Other studies could determine their results and whether or not they use ESPCs.

2. ESPC Application in Other Federal Agencies

Besides the DoD, there are three other Federal Agencies: NASA, Department of Homeland Security and General Services Administration (GSA), which have similar or related missions. Thus, other research can be done to explore what other Federal Agencies do to meet their energy consumption or savings goals. If they use ESPCs as their regionalization tool, what have their results been? Or, if they utilize other contracting tools, how have these outcomes measured up?

3. The Applications of Regionalization for Other Contracting Effort

Since the ESPC is the dynamic mechanism for agencies to upgrade their existing infrastructures without having to allocate the high upfront recapitalization cost, more research should be conducted to discover the approach's success beyond the limit of energy acquisition. Further research should be performed on using a regional approach for the procurement of other supplies and services. For example, what is the feasibility of using a regional IDIQ contract for ground maintenance, food service, communication service, or to fulfill other requirements or to fulfill other joint service requirements?

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Appendix A.

CLIN 0001—Phase I: Preliminary Site Survey for Feasibility Study

Following is a list of some important checklist items and information within the process of Phase I (Solicitation document, 1997, p. 11):

- With options, if the Government and the ESCO mutually agree that Phase I work is unnecessary, the Government may direct the ESCO to proceed directly to Phase II. Only the CO can direct the proceeding of any phase.
- The purpose of Phase I is to allow an ESCO to perform an official facilities evaluation and to explore energy-savings project opportunity. Preferably, it should be done in the least amount of time possible, because the time, consultation, and resources that the ESCO invested are only reimbursable if the project proves to save money.
- The CO will provide the ESCO a prioritized listing of facilities to be evaluated for energy-conservation opportunities, identifying the possibility to improve "finance, design, implement, monitor, and maintain various energy conservation measures (ECMs)."
- The summary report contains the ESCO's recommendations for the government to make the decision whether Phase II is feasible.
- The ESCO shall evaluate or produce implementation plans only for the targeted facilities that have savings opportunities with payback of 10 years or less. A 10-year simple payback is defined as the contractor's capital investment cost divided by the annual guaranteed savings.
- Based on the results of the preliminary survey, the ESCO shall prepare an estimate of the potential energy (e.g., BTU, Kwh, Kw, etc.) and cost (dollars) savings the Government could expect by implementing the recommended ECM. Furthermore, estimated net benefit equals the estimated savings minus any costs or fees the ESCO intends to recover (i.e., debt service and maintenance, monitoring, measurement and verifications (M&V) fees, etc.).

CLIN 0002—Phase II: Facility Energy Audit, Economic Analysis, and Investment Grade Auditing. The following is a list of some important checklist items and information within the process of Phase II (Solicitation document, 1997, p. 12):

The purpose of Phase II is to allow the ESCO to perform measurement and to provide the Government with an audit report identifying each proposed Energy Conservation Project (ECPs).

- The CO will issue a letter to the ESCO to include a prioritized listing of facilities in which the ESCO is to perform a Phase II Audit and Analysis.

- The ESCO shall commence an energy audit and lifecycle-cost economic analysis for each approved ECP, identifying the energy conserving/efficient equipment and other improvements to be provided (with detailed specifications and drawings).
- The tasking includes: 1) Auditing existing mechanical, electrical, and control systems and the envelope of each facility, 2) Conducting an in-depth interview with the installation energy manager, engineers, maintenance, and operating personnel to assess the operating characteristics of existing energy systems and goals for system improvements, and 3) Reviewing Air Force plans for other non-energy-related capital improvements and renovations for inclusion in this analysis.
- The ESCO shall consider all measurable, utility, energy-related information when establishing the energy consumption baseline. Accessibility to the data must be available upon request.
- Phase II—The Facility Energy Audit and Economic Analysis report can be used as a proposal to accomplish the Phase III—ECM Implementation. The required format is as follows:

EXHIBIT A - Synopsis of Proposed ECM and Technical Proposal

EXHIBIT B - Calculations of Savings, Measurement and Verification (M&V) Plan

EXHIBIT C - ESCO Compensation Plan

EXHIBIT D - Buildings with Number, Principle Function and Street Address

EXHIBIT E - Baseline Data with historical energy use of the building(s) with explanatory records documenting how the baseline was developed.

EXHIBIT F - ESCO Post-implementation Responsibilities

EXHIBIT G - Government Post-implementation Responsibilities

EXHIBIT H - Standards of Service

EXHIBIT I - Final Performance Tests

EXHIBIT J - Equipment Availability and ECM Implementation Schedule

EXHIBIT K - Termination or Buyout Costs

Appendix B.

CLIN 0003—Phase III: ECM Implementation Performance Period

Following is a list of some important checklist items and information within the process of Phase III (Solicitation document, 1997, p. 22):

- The purpose of Phase III is to allow the ESCO to implement the proposed Energy Conservation Project (ECP).
- Phase III—ECM Implementation and Operations/Maintenance: Whereas Phase I and Phase II work may be directed by letter, Phase III—ECM Implementation shall only commence upon the issuance of a contract task order by the Contracting Officer. In case of conflict between the terms of the task order and the basic contract, the terms of the contract shall take precedence.
- As Phase II—Facility Energy Audit and Economic Analysis reports were used as a proposal to accomplish the Phase III—ECM Implementation, three other exhibits are added to the previous exhibits A to K:

EXHIBIT L - Pre-existing Equipment Inventory

EXHIBIT M - Subcontracting Plan

EXHIBIT N - ECPs Evaluated—Not Recommended for Implementation

- Each contract task order shall establish a date by which all ECM implementation work will be completed, with the following contractual bidding information:
- Inspection and Acceptance
- Work Schedule
- Work Clearance (Construction/Digging/Welding Permits)
- Equipment Measurements and Frequencies
- Continued Use of Facilities
- Disposal of Materials
- Contractor-provided Materials and Equipment
- Furthermore, there are fourteen subheadings with relevant details for each of the following contractual categories: Codes and Standards, Facility and Equipment Disposition, Environmental Protection, Fire and Ambulance Jurisdiction, Year 2000 Compliant Technology, Daily Cleanup, Engineering Drawings, Warranties and Operating Manuals, ESCO-provided Maintenance, Interruption of Utility Services, ECM Implementation Completion, Acceptance Testing of ESCO-installed Equipment, Monthly Energy Savings, and References to official publications of the USAF organization, DoD, *Public Law 97-214*, and *Executive Order 12873*.

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Appendix C.

Part I—The Schedule

A. Solicitation/contract form

B. Supplies or services and prices/costs

C. Description/specifications/statement of work

- Part 1: General information
- Part 2: Scope with explanation for Phase I, II, and I
- Part 3: Training
- Part 4: Definition

D. This section is omitted

E. Inspection and acceptance

F. Deliveries or performance

G. Contract administration data

H. Special contract requirements

Part II—Contract Clauses

I. Contract clauses

Part III—List of Documents, Exhibits, and Other Attachments

J. List of attachments

Part IV—Representations and Instructions

K. Representations, certifications, and other statements of offerors or respondents

L. Instructions, conditions, and notices to offerors or respondents

M. Evaluation factors for award

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- Special Termination Liability in MDAPs

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- R-TOC Aegis Microwave Power Tubes
- Privatization-NOSL/NAWCI
- Army LOG MOD
- PBL (4)
- Contractors Supporting Military Operations
- RFID (4)
- Strategic Sourcing
- ASDS Product Support Analysis
- Analysis of LAV Depot Maintenance
- Diffusion/Variability on Vendor Performance Evaluation
- Optimizing CIWS Life Cycle Support (LCS)

Program Management

- Building Collaborative Capacity
- Knowledge, Responsibilities and Decision Rights in MDAPs
- KVA Applied to Aegis and SSDS
- Business Process Reengineering (BPR) for LCS Mission Module Acquisition
- Terminating Your Own Program
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