



FEMP ESPC Workshop Handbook

June 11 – 13, 2013
San Diego, CA



U.S. Department of Energy
Energy Efficiency and Renewable Energy

Rev 6/2/2013



FEMP
Comprehensive ESPC Workshop
Handbook

Contents

Workshop Agenda	v
FEMP ESPC Contacts (FFS's)	vii
ESCO Contacts	viii
Abbreviations and Acronyms	ix
ESPC Resources Page on FEMP Web Site	xi
Workshop Learning Objectives.....	xv
CEUs for FEMP Training.....	xvii
ESPC Project Flowcharts.....	xix
 Presentations	
A. Introduction	1
B. ESPC Basics.....	9
C. Phase 1 – Acquisition Planning	17
D. Efficient Products, Advanced Technologies, and Renewables: Getting Deeper Savings from your ESPC	23
E. Phase 2 – ESCO Selection and Preliminary Assessment.....	35
F. Introduction to M&V.....	45
G. Risk, Responsibility, and Performance Matrix.....	57
H. Phase 3 – Project Development – Overview of Process: Investment-Grade Audit (IGA) and Proposal Through Negotiations and TO Award	67
I. Proposal Review – ECMs and Management Approach and ECMs.....	79
J. Proposal Review – TO Financial Schedules.....	85
K. Proposal Review – Financing.....	99
L. Proposal Review – Pricing	107
M. Phase 4 – Phase 4: Implementation — Design – Construction – Acceptance	113
N. Phase 5 – Post-Acceptance Performance	121

Agenda

	Day 1		Day 2		Day 3
8:00 am — Continental Breakfast					
8:30 am — Workshop Begins					
A	Introduction	EX 3	Preliminary Assessment Review	L	Proposal Review – Pricing
B	ESPC Basics	F	Introduction to M&V	EX 5	TO Schedules Review
C	Phase 1 – Acquisition Planning	G	Risk, Responsibility, and Performance Matrix	M	Phase 4 – Implementation – Construction through Acceptance
				N	Phase 5 – Post-Acceptance Performance
Lunch (90 minutes)					
D	Efficient Products, Advanced Technologies, and Renewables: Getting Deeper Savings from your ESPC	H	Phase 3 – Project Development – Overview of Process	EX 6	Post-Installation and First-Year M&V Reports
EX 1	Acquisition Planning	I	Proposal Review – ECMs and Management Approach	O	Success Stories
E	Phase 2 – ESCO Selection and Preliminary Assessment	EX 4	Proposal Review		
EX 2	ESCO Selection	J	Proposal Review – TO Financial Schedules		
		K	Proposal Review – Financing		
Adjourn 5:00 pm		Adjourn 5:00 pm		Adjourn 4:30 pm	



FEMP ESPC Contacts



www1.eere.energy.gov/femp/financing/espcs_financingspecialists.html

DOE-FEMP ESPC ESCOs

See FEMP's Web site at http://www1.eere.energy.gov/femp/financing/espcs_doeescos.html for contact information, ESCO Web site addresses, and ESCO qualification sheets.

Ameresco, Inc.

Chevron Energy Solutions

Clark Energy Group, LLC

Consolidated Edison Solutions, Inc.

Constellation Energy Projects & Services Group, Inc.

FPL Energy Services, Inc.

Honeywell International, Inc.

Johnson Controls Government Systems, L.L.C.

Lockheed Martin Services, Inc. (dba: LMSI)

McKinstry Essention, Inc.

NORESCO, LLC

Pepco Energy Services

SAIC Energy, Environment & Infrastructure

Schneider Electric Buildings Americas, Inc.

Siemens Government Services, Inc.

Trane U.S., Inc. (dba: Trane)

Abbreviations and Acronyms

ACO	Agency administrative contracting officer
CHP	Combined heating and power
CICA	Competition in Contracting Act
CO	Contracting Officer
COR	Contracting Officer's Representative
DOE	U.S. Department of Energy
ECM	Energy-conservation measure
EERC	Energy Escalation Rate Calculator
EMCS	Energy management control system
EPACT	Energy Policy Act of 1992
ESCO	Energy services company
ESPC	Energy savings performance contract(ing)
FAR	Federal Acquisition Regulation
FASA	Federal Acquisition Streamlining Act
FEMP	DOE Federal Energy Management Program
FFS	FEMP Federal Financing Specialist
FPP	Financing procurement price
FTE	Full-time employee/equivalent
FY	Fiscal year
GHP	Geothermal heat pump
HVAC	Heating, ventilating, and air conditioning
IAA	Interagency agreement
IDIQ	Indefinite-delivery, indefinite-quantity (contract)
IDS	Investor's deal summary
IGA	Investment-grade audit
IGE	Independent government estimate
IPP	Implementation-period payment
M&O	Management and operating (contractor)
M&V	Measurement and verification
NDAA	National Defense Authorization Act
NOI	Notice of intent to award task order
NTP	Notice to Proceed with Construction
O&M	Operations and maintenance

PA	Preliminary assessment
PF	Project facilitator
PV	Photovoltaics
RECs	Renewable energy credits
RRPM	Risk, Responsibility, and Performance Matrix
R&R	Repair and replacement
RFP	Request for proposal
SFO	Standard financing offer
SPB	Simple payback period
STR	Site Technical Representative
TMY	Typical meteorological year
TO	Task order
TO RFP	Task order request for proposal
UESC	Utility energy services contract
USC	United States Code

FEMP's ESPC Resources Page

For your information, listed below are the contents of the ESPC Resource page on FEMP's Web site at http://www1.eere.energy.gov/femp/financing/espcs_resources.html.

Resources and Guidance for Implementing Energy Savings Performance Contracts

The following contract tools and guidance documents are designed to help Federal agencies implement energy savings performance contracts (ESPCs). These resources are organized into 10 topic areas covering the process of developing, awarding, and administering ESPC task orders, including critical and required contract documents and best practices.

Software resources are also available after the 10 topic areas.

1. Indefinite Delivery, Indefinite Quantity Energy Savings Performance Contracts

Provides an introduction to Indefinite Delivery, Indefinite Quantity (IDIQ) ESPCs:

- 1.1: [ESPC IDIQ Contract](#)  (Modified January 2013)
- 1.2: [ESPC IDIQ Contract Modifications](#) (Modifications below are those under the current ESPC IDIQ contract that are applicable to all ESCOs. ESCO specific modifications (i.e. Novations, name changes, etc.) are not included below. As well, note that effective dates of modifications may vary slightly.)
 - 1.2.1: [Modification 001](#) 
 - 1.2.2: [Modification 002](#) 
 - 1.2.3: [Modification 003](#) 
 - 1.2.4: [Modification 004](#) 
 - 1.2.5: [Modification 005](#) 
 - 1.2.6: [Modification 006](#) 
- 1.3: [IDIQ ESPC FAQ](#) 

2. Overviews and Processes

Outlines processes and considerations to help Federal agencies begin Department of Energy (DOE) ESPC planning:

- 2.1: [Practical Guide to Savings and Payments in ESPC Task Orders](#) 
- 2.2: [Risk, Responsibility, and Performance Matrix \(IDIQ Attachment J-7\)](#) 
- 2.3: [Fine Tuning for Best-Value ESPC Deals Using the Responsibility Matrix](#) 
- 2.4: [Introduction to Measurement and Verification \(M&V\) for FEMP ESPC Projects](#) 
- 2.5: [M&V Planning Tool](#) 

3. FEMP Assistance and Project Facilitation

Includes FEMP-provided templates and sample statements of work for engaging a FEMP Project Facilitator:

- 3.1: [FEMP Services Interagency Agreement Templates](#)
- 3.2: [Typical Statement of Work \(for ESPC Project\)](#)
- 3.3: [FEMP Support to Preliminary Assessment for ESPC Project](#)
- 3.4: [Optional Services for ESPC Project](#)

4. Energy Service Company Selection, Project Kickoff, Preliminary Assessment

Guides Federal agencies through selecting an energy service company (ESCO), project kickoff and preliminary assessment activities. The templates were last updated April 6, 2011. Future revisions may occur. Check back to ensure you are using the latest version rather than saving them to your local drive.

- 4.0: [Overview of the ESCO Selection Process and FEMP ESPC Templates](#)
- 4.1: [Acquisition Plan Strategy and Guidance](#)
- 4.2: [FEMP Suggested ESPC Milestone Plan](#)
- 4.3: [Preparation of the Notice of Opportunity](#)
- 4.4: [ESCO Expression of Interest](#)
- 4.5: [ESCO Expression of Interest Evaluation Worksheet](#)
- 4.6: [Letter to Unsuccessful Company](#)
- 4.7: [Letter to Successful Company](#)
- 4.8: [Form for Case Studies and References](#)
- 4.9: [Oral Presentation Guidance](#)
- 4.10: [Preliminary Assessment Template](#)
- 4.11: [Preliminary Assessment Review for Federal ESPCs](#)

5. Final Proposal and Award

Includes guidance documents and resources surrounding the final ESPC proposal and awarding contracts to selected ESCOs:

- 5.1: [Task Order Request for Proposal \(RFP\) Prescriptive Template for DOE ESPCs](#)
- 5.2: [ESPC Energy Conservation Measure Benchmarking Costs Support](#)
- 5.3: [Investment-Grade Audit Kickoff Meeting Agenda](#)
- 5.4: [Task Order Financial Schedules \(IDIQ Attachment J-6\)](#)
- 5.5: [Descriptions of Task Order Schedules and Placement of Pricing Information \(IDIQ Attachment J-5\)](#)
- 5.6: [Determining Price Reasonableness in Federal ESPCs](#)
- 5.7: [Task Order Price Evaluation Worksheet](#)

- 5.8: [Investor's Deal Summary \(IDIQ Attachment J-11\)](#)
- 5.9: [Standard Financing Offer \(IDIQ Attachment J-12\)](#)
- 5.10: [Pre-Award Deliverables Sample \(First Part of Sample Deliverables for Task Orders, IDIQ Attachment. J-4\)](#)
- 5.11: [Face Page Template](#)
- 5.12: [Planning for Life of Contract](#)

6. Measurement and Verification Plan

Features guidance documents and samples to help Federal agencies create M&V plans:

- 6.1: [Example M&V Plan for an ESPC Project](#)
- 6.2: [M&V Plan and Savings Calculations Methods Outline \(IDIQ Attachment J-8\)](#)
- 6.3: [Reviewing M&V Plans for Federal ESPC Projects](#)

7. Implementation, Construction, Project Acceptance

Provides guidance on navigating the implementation stage of ESPC projects:

- 7.1: [Post-Award Meeting Agenda Items](#)
- 7.2: [Commissioning Guidance for DOE ESPCs](#)
- 7.3: [Post-Award Deliverables Sample \(Second Part of Sample Deliverables for Task Orders, IDIQ Attachment. J-4\)](#)
- 7.4: [Guidelines, Checklist, and Contract Clauses for Government Acceptance of DOE ESPC Projects](#)

8. Post-Installation and Annual Measurement and Verification Performance Reports

Details requirements and guidance for producing and reviewing post-installation and annual M&V reports; Includes guidance to help Federal agencies sustain effective administration of the contract throughout its term and ensure that guaranteed savings are delivered:

- 8.1: [Post-Installation Report Outline \(IDIQ Attachment J-9\)](#)
- 8.2: [Annual Report Outline \(IDIQ Attachment J-10\)](#)
- 8.3: [Guide to Government Witnessing and Review of Post-Installation and Annual M&V Activities](#)
- 8.4: [Reviewing Post-Installation and Annual Reports for Federal ESPC Projects](#)
- 8.5: [DOE ESPC Life of Contract Plan Template](#)

9. Measurement and Verification

Details the execution of M&V activities to determine performance and cost savings across DOE ESPCs:

9.1: [FEMP M&V Guidelines Version 3.0](#)

9.2: [International Performance Measurement and Verification Protocol \(IPMVP\)](#)

9.3: [How to Determine and Verify Operations and Maintenance \(O&M\) Savings in Federal ESPCs](#)

See Also: 2. Overviews and Process: 2.5 and 2.6

6. M&V Plan: 6.1, 6.2, and 6.3

8. Post-Installation and Annual M&V Performance Reports: 8.1, 8.2

10. Operations and Maintenance, Continuous Commissioning, and Retro-Commissioning

Covers ongoing O&M and commissioning activities through the life of the completed ESPC project:

10.1: [FEMP Continuous Commissioning Guidebook](#)

10.2: [Including Retro-Commissioning in Federal ESPCs](#)

10.3: [Example Retro-Commissioning Statement of Work to Include Services as Part of an ESPC Detailed Energy Survey](#)

10.4: [Planning and Reporting for O&M in Federal ESPCs](#)

10.5: [FEMP O&M Best Practices Guide](#)

Software

The following software assists Federal agencies in evaluating ESPC projects:

- **Building Life-cycle Cost (BLCC):** Conducts economic analyses by evaluating the relative cost effectiveness of alternative buildings and building-related systems or components. The program is typically used to evaluate designs that have higher initial costs but lower operating costs of the life of a project.
- **Energy Escalation Rate Calculator (EERC):** Computes an average annual escalation rate for fuel prices from the annual energy price forecasts of the DOE Energy Information Administration. This rate can be used to escalate contract payments in UESCs and ESPCs when the payments are based on projected annual energy cost savings.

FEMP Comprehensive ESPC Workshop Learning Objectives

The overall objective of the workshop is to provide agency personnel with a comprehensive understanding of the ESPC process and a springboard to obtaining the information and tools needed to ensure that their projects are of the highest possible value.

Workshop participants will be able to:

ESPC Basics

- Explain the ESPC authority as a tool for energy and cost savings at federal agencies.
- List the enabling authority to enter into third-party financing agreements to fund federal energy projects.
- Describe how ESPCs re-allocate current spending and how agencies can ensure that their projects are of the highest possible value.

Phase 1 – Acquisition Planning

- Describe the project planning activities that will set the stage for a successful ESPC project including the Acquisition Team’s critical roles and responsibilities.
- Understand how to develop a Notice of Opportunity to solicit expressions of interest

Phase 2 – ESCO Selection and Preliminary Assessment

- Explain how to use the simplified ESCO selection procedures for task orders under the DOE-FEMP IDIQ
- Define the level of information required to be included in a Preliminary Assessment.
- Explain how to conduct the Preliminary Assessment process as it relates to proceeding or not proceeding with the contractor’s proposal.
- Explain how the ESCO recovers its costs for developing the preliminary assessment, investment-grade audit, and proposal.

Measurement & Verification

- Describe why an agency needs Measurement and Verification (M&V) and why there is so much focus on M&V.
- Recognize that Measurement and Verification is dependent upon a good solid baseline. The data the ESCO receives from the site must be accurate and complete.

Phase 3 – Project Development – TO RFP, Investment-Grade Audit, TO Award

- Identify the elements of the final proposal understanding that the contractor integrates findings from the IGA with the requirements stated in the IDIQ and Task Order RFP to produce the Final Proposal.
- Explain the importance of the Task Order RFP and why it is a departure from standard contracting.
- Discuss how ESPC projects are financed and what constitutes a good deal for the government.

Phase 4 – Implementation – Construction, Post-Installation M&V, Project Acceptance

- Recognize that there is little difference between the construction phase of an ESPC project and any other construction project.
- Understand the importance of the differences between the construction phase of an ESPC project and any other construction project.
- Understand the importance of commissioning and post-installation M&V in ESPC projects.

Phase 5 – Post-Acceptance Performance Period

- Understand the quality assurance agencies are required to maintain in the performance period, for the life of the contract.
- Be prepared to ensure that the ESCO carries out its responsibilities to perform annual M&V, submit annual M&V reports, and deliver guaranteed savings and performance.

CEUs for FEMP Training

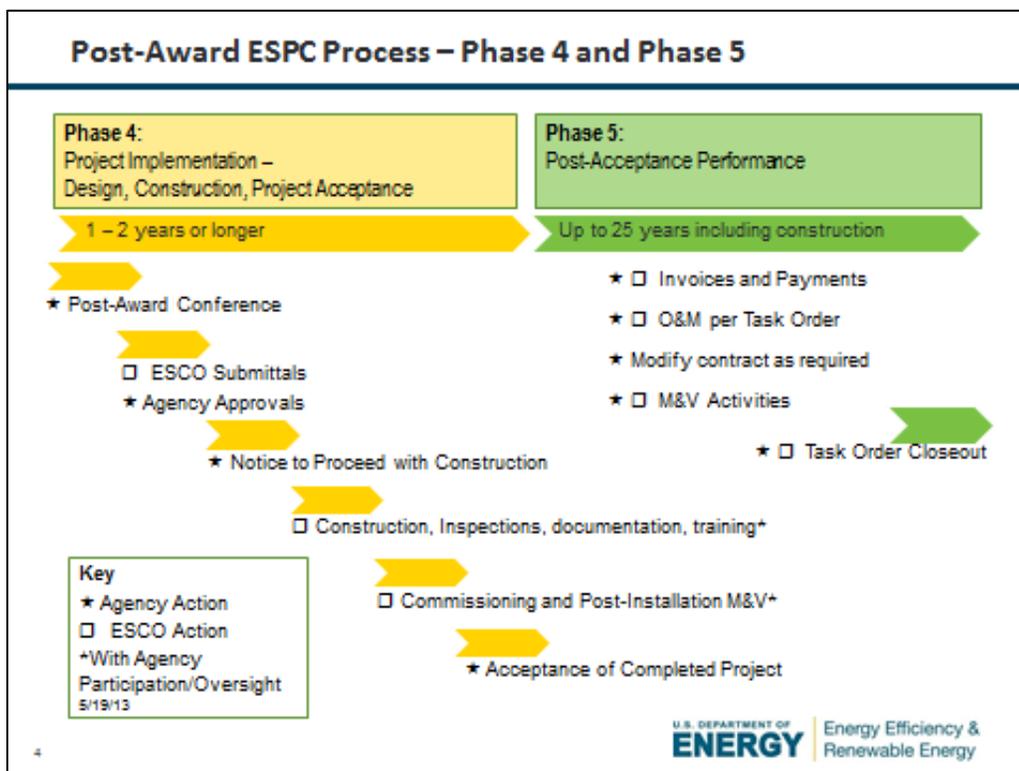
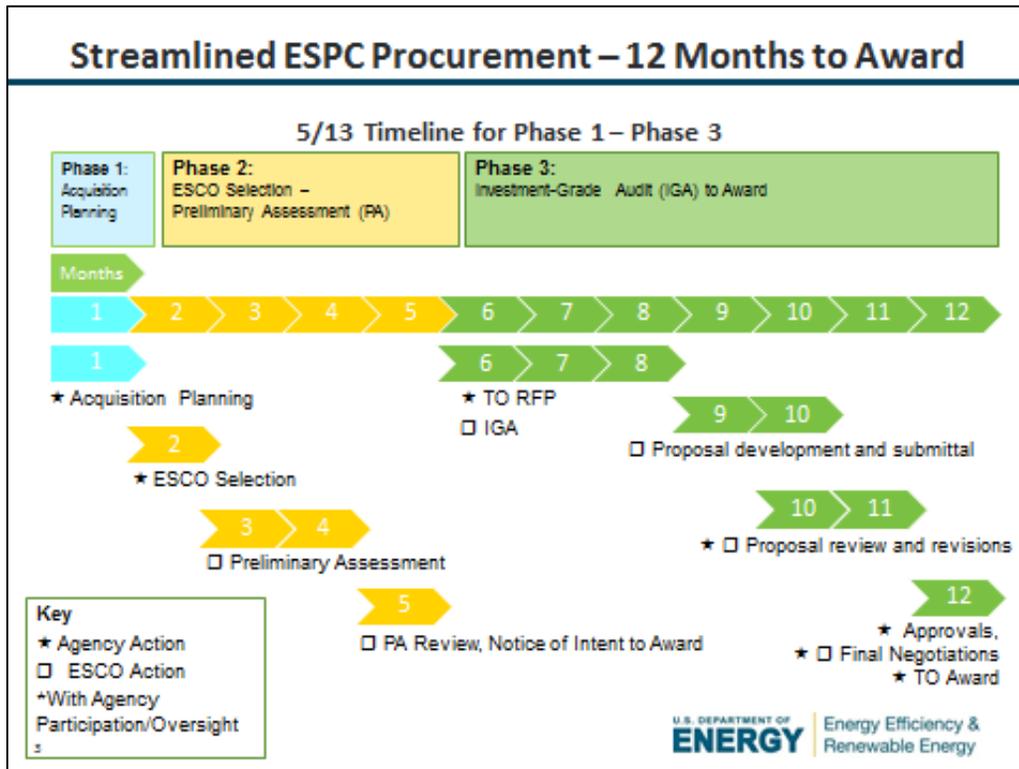
CEUs for FEMP Training

- FEMP is seeking to become accredited and authorized to award certified continuing education units (CEUs)
- FEMP is now demonstrating compliance
 - Required to gain accreditation
- Prior to FEMP's accreditation
 - Changes are not obvious to participants, but do improve training
 - *Non-accredited FEMP CEUs* will be awarded upon successful completion of a FEMP training event

Students must complete on-line test and course evaluation to receive certificate

- Follow this link to WBDG:
www.wbdg.org/education/femplt04162013.php
 - Link is available only to attendees, only for two weeks
- Enroll/Register
 - Enroll only once – the site will thereafter keep records of all the student's training
- Take the test
 - Min. 80% correct answers required to pass
- Complete the evaluation to receive your certificate
 - For access to records/download certificates, click "My Account" on WBDG home page tab

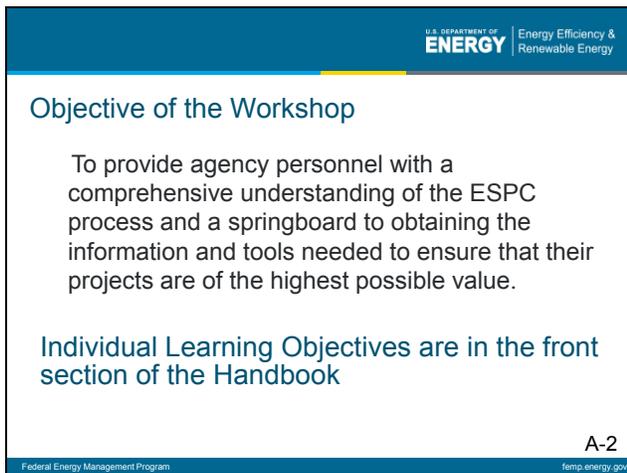
ESPC Project Flowcharts



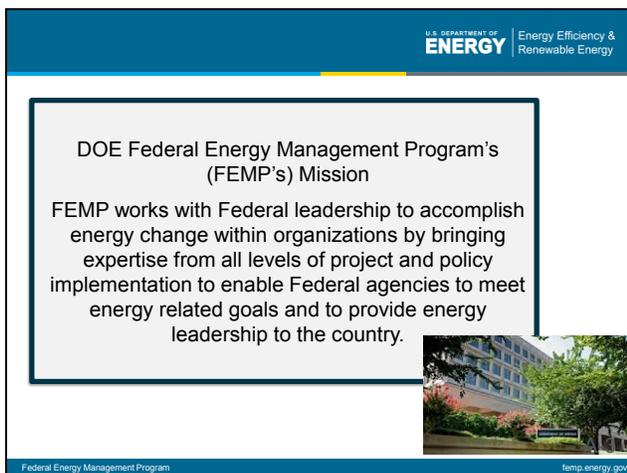
A – Introduction



This workshop discusses the process of developing, awarding, implementing, and administering an ESPC task order. Although the workshop will not provide all the information that a contracting officer or facility energy manager will need to carry out an ESPC project, nor make ESPC novices into masters, this training does provide a roadmap, along with signposts to resources and assistance to help agencies ensure that their ESPC projects are technically excellent and financially smart.



Federal personnel learn about best practices for ESPCs that are reflected in this training as they go through the process, working with FEMP and their project facilitator.



Why is FEMP so involved in ESPCs?

FEMP's mission is to help agencies manage their energy use and meet energy goals. Congress authorized agencies to use ESPCs to address the fact that many agencies have insufficient appropriations to make energy improvements, and tasked FEMP with establishing the ESPC program to help agencies use ESPCs.

The FEMP home page is your source on energy and sustainability:
www1.eere.energy.gov/femp/index.html ★

The screenshot shows the FEMP home page with a navigation menu including Home, About the Program, Program Areas, Laws & Regulations, Information Resources, Project Funding, Technologies, Services, and News & Events. A 'FEMP SERVICE AREAS' section highlights 'Laws, Regulations, & Reporting' and 'Sustainable Buildings & Campuses'. A 'RENEWABLE ENERGY' banner features a wind turbine image. A 'NEWS' section lists recent announcements from DOE.

A-4

FEMP carries out its mission through a wide variety of resources and services for agencies. Most of these resources are available through FEMP’s Web site.

ESPC Web Pages:
www1.eere.energy.gov/femp/financing/espcs.html
 FEMP home page → Project Funding → ESPCs

- Assistance and contacts
- Resources – **ESPC contract documents**, templates
 – See handbook front for contents
- Laws & Regulations
- Energy Service Companies (ESCOs)
- Awarded Contracts
- Case Studies
- Training
- Energy Awards Programs

A-5

Note that you will find information on Federal awards for energy and water management under *Services*, and then *Awards Programs*.

FEMP’s ESPC Team is dedicated to helping agencies make the most of their ESPC projects

- The FEMP Federal Financing Specialist (FFS)
 – Your first point of contact
- FEMP Project Facilitators (PFs)
- National Lab experts supporting the FEMP ESPC program
- DOE Golden Office – ESPC contracting support

(More details provided throughout the workshop)

A-6

FEMP ESPC Contacts — FEMP Federal Financing Specialists (FFS’s)

The map shows the following regional assignments:

- West-Midwest:** Scott Wolf, Western Region including N. Marianas, Palau, Guam, American Samoa; plus East, South, and Central Asia; the Pacific, and Near East. 360-866-9163, scott.wolf@ee.doe.gov
- Southeast-Midwest:** Doug Culbreth, Southeast Region plus Europe and Western Hemisphere. 919-870-0051, carson.culbreth@ee.doe.gov
- Northeast:** Tom Hattery, Northeast Region plus State Dept. 202-256-5986, thomas.hattery@ee.doe.gov

www1.eere.energy.gov/femp/financing/espcs_financingspecialists.html A-7

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Free FEMP ESPC Training

- FY 2014 Comprehensive ESPC workshops:
See FEMP Calendar of Events
- Customized agency workshops available
- On-demand Webinars
- FEMP Calendar of Events (all training dates)
http://www1.eere.energy.gov/femp/financing/espcs_training.html
Go to Project Funding → ESPCs → Training

Training

Knowledge
useful abilities
backbone of co
quired for a tr
oday

A-8

Federal Energy Management Program femp.energy.gov

FEMP Training Announcements

You may sign up to receive a digest of FEMP training opportunities and other activities through email.

1. Go to:
https://public.govdelivery.com/accounts/USEERE/subscriber/new?topic_id=USEERE_337
2. After entering your email address, click the *Next* button to see the available their mailing lists. Scroll down about half-way and select:
Federal Energy Management and *Weekly update of events, training, publications, and announcements*, and any other lists that you wish to subscribe to.
3. **SAVE YOUR CHANGES** by scrolling to the bottom and clicking the *Submit* button.

On-Demand Training and Webinars

(See <http://apps1.eere.energy.gov/femp/training/etraining.cfm>.)

Previously recorded training sessions are available at any time—on demand. FEMP currently has the following webinars available:

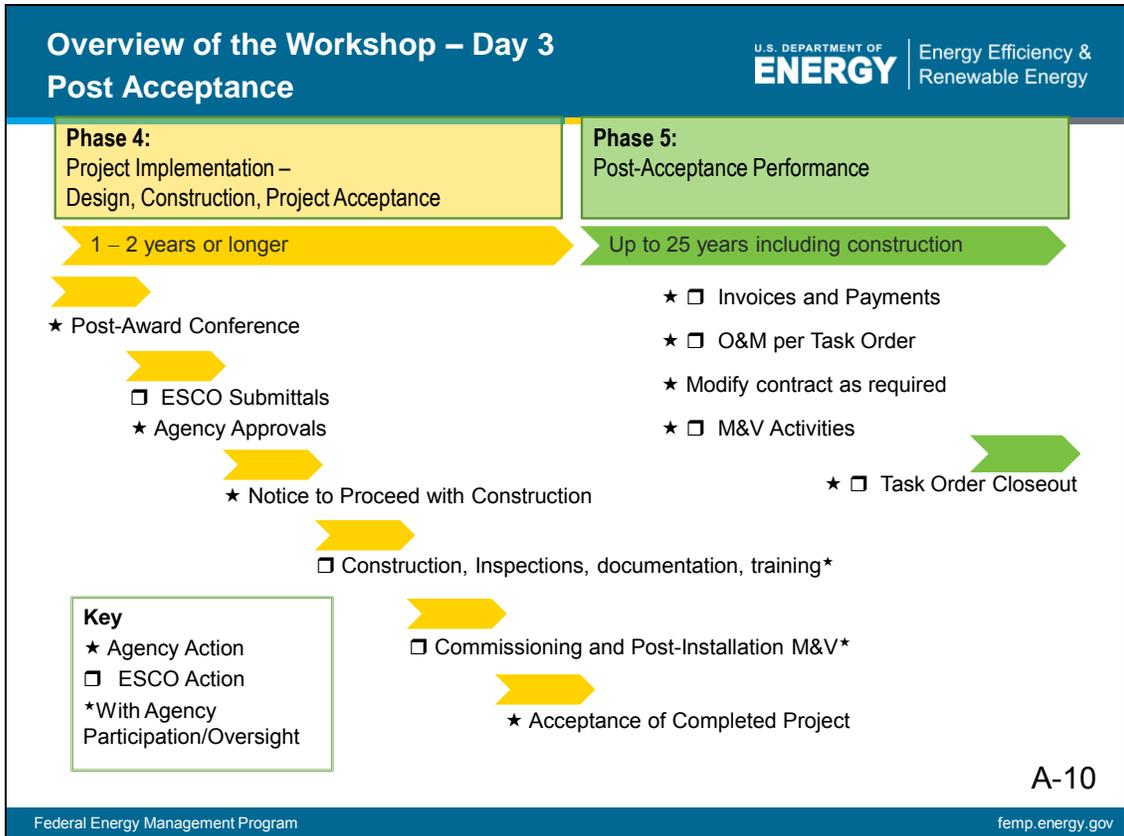
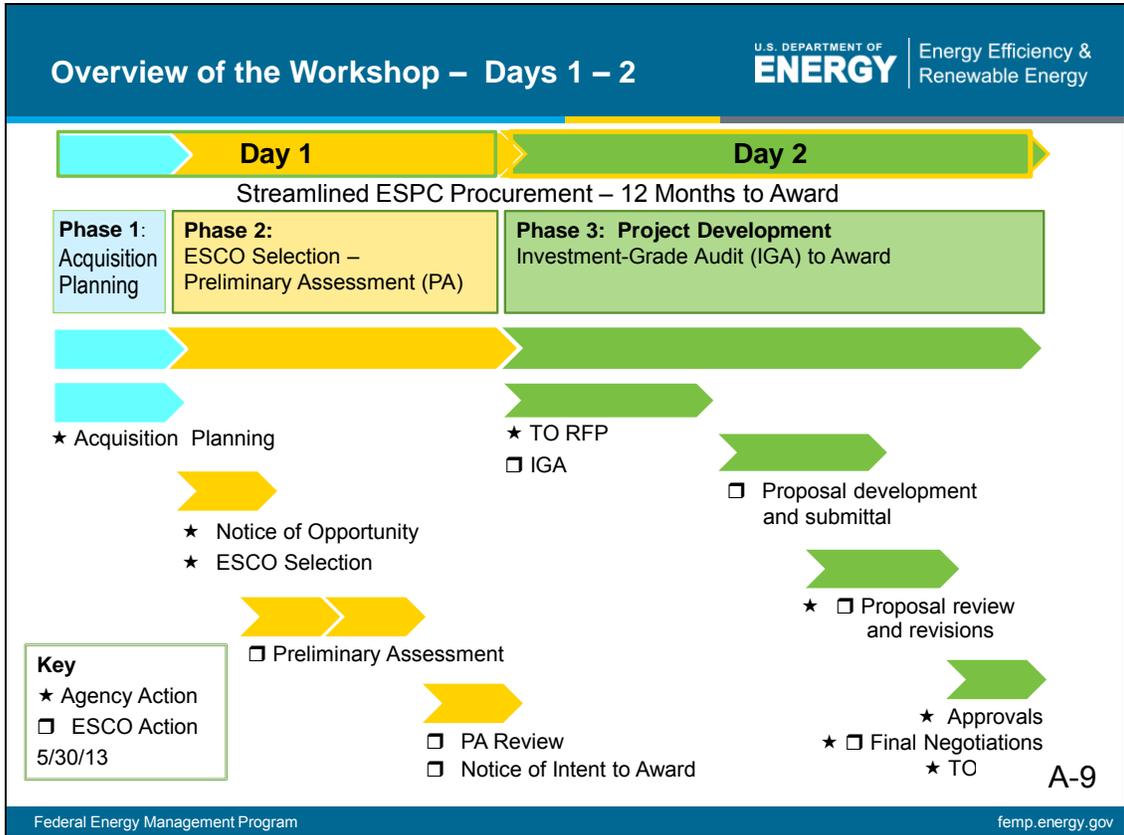
Energy Savings Performance Contracts: First Thursday Seminar outlining how Federal agencies can work with energy service companies (ESCOs) to streamline contract funding for energy management projects. Recorded March 3, 2011.

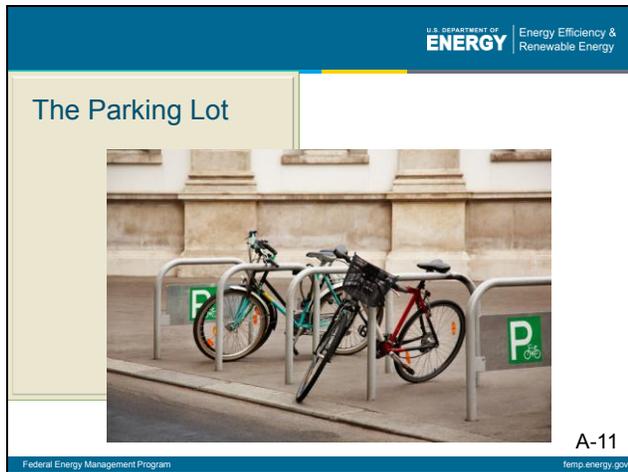
Introduction to Alternative Financing for Energy Efficiency and Renewable Energy

Introduction to Energy Savings Performance Contracts

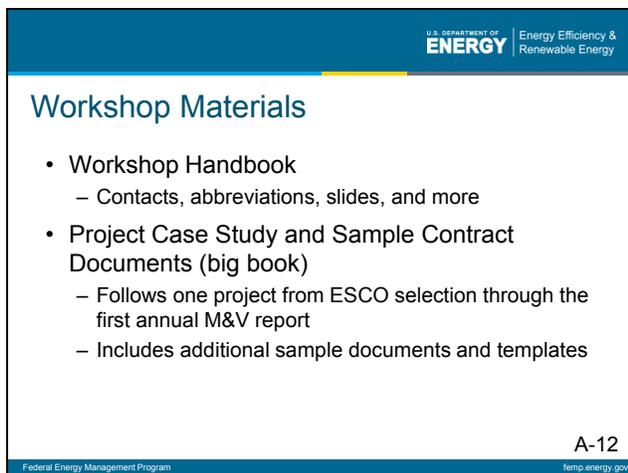
Financing and Pricing Evaluation for Energy Savings Performance Contracts

Energy Savings Performance Contract Contracting and Negotiations





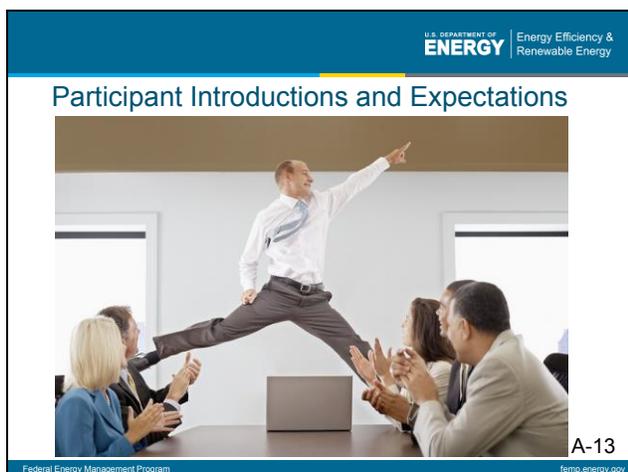
To help us get the most out of our time here, we'll be using the "parking lot." We hope you will ask lots of questions, but when we get a question that will be covered in the material that's coming up, we'll put it in the parking lot and then make sure it does get answered.



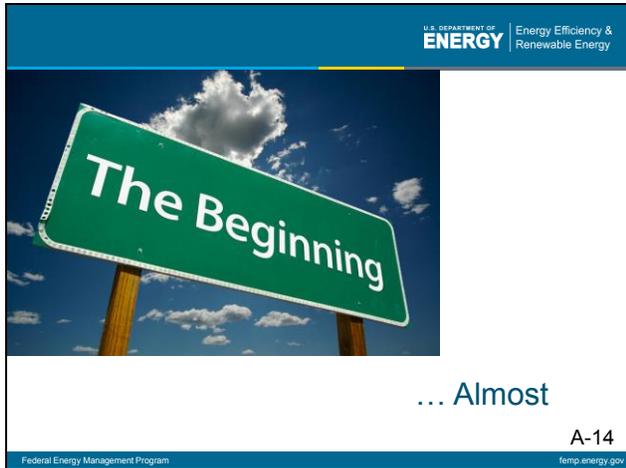
In this Workshop Handbook, you'll find the following in the front matter:

- Table of contents
- Workshop agenda
- Contact information for the FEMP Federal Financing Specialists
- Listing of the ESPC ESCOs and Web addresses for contact info and qualifications sheets
- Abbreviations and acronyms used in the workshop
- Contents of the FEMP ESPC Resources page

This page is where you'll find the DOE ESPC master contract, plus all of FEMP's ESPC guidance and tools, such as the M&V Guidelines, and links to software tools.



All the workshop presentations are also in the handbook.



Before diving into the subject of ESPCs in earnest, we will spend a few minutes talking about other alternative financing options that FEMP can help you with.

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

What are ESPCs?

Contracts that allow agencies to do energy projects with minimal up-front capital cost and no special appropriations from Congress.

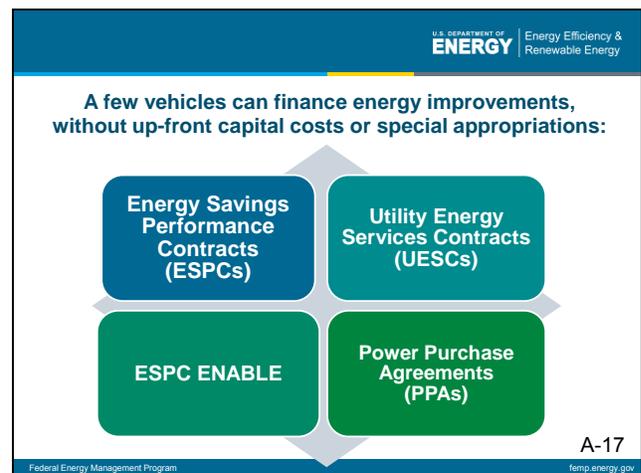
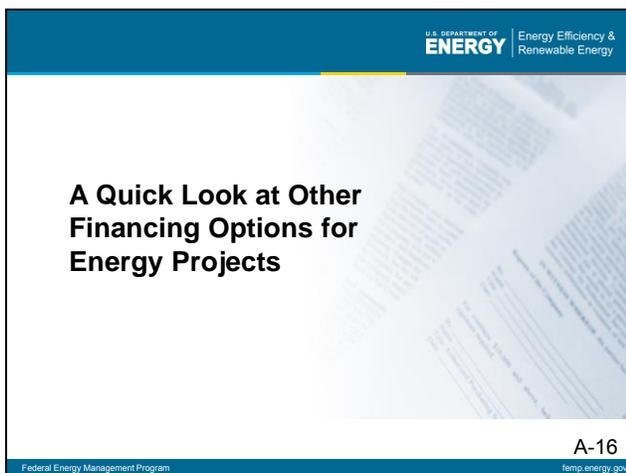
Energy Services Company (ESCO)	<ul style="list-style-type: none"> Provides development and installation of energy/water conservation measures Guarantees resulting cost savings sufficient to cover project costs
Agency	<ul style="list-style-type: none"> Pays ESCO over term of contract from guaranteed cost savings Contract administration → life of contract

A-15

Federal Energy Management Program | fem.energy.gov

First, a functional definition of energy savings performance contracts: ESPCs are a contracting vehicle that allows agencies to procure energy savings and facility improvements without up-front capital costs or special appropriations from Congress.

The energy services company, or ESCO is a private-sector contractor that develops, designs, and implements improvements at the project site and borrows the money to pay for it. The agency pays the ESCO over the term of the contract out of the energy and energy-related savings resulting from the project.





Comparison of DOE ESPCs, ESPC ENABLE, UESCs

	DOE ESPCs	ESPC ENABLE (A FEMP Pilot)	UESCs
Contract type	TOs under DOE IDIQ	GSA Schedule 84 (SIN246-53)	GSA Area-wide contracts; Basic ordering agreements
Private-sector partner	ESCO	ESCOs on GSA Schedule 84 (SIN246-53)	Serving utility company
Eligible facilities	Federally owned worldwide	Federally owned facilities	Where government pays utility bill; where offered/authorized
Project size	\$1 – 2 million or larger	< \$1M; bldgs <200K sqft and site bundling are anticipated	Any
ECMs	Unlimited	Lighting, water, and basic HVAC controls	Unlimited
Savings guarantees and M&V	Required	Required; simplified M&V	Negotiable; performance assurance required for annual scoring
O & M	ESCO is responsible; tasking is negotiable	Government is responsible; ESCO provides training	Negotiable

A-19

One thing to notice is that UESCs are only available where the serving utility offers them (or where the public utility authority allows them). UESCs are generally suitable for projects that are too small to be attractive to an ESCO.

The deciding factor for many agencies who have used UESCs has been that they had a good longstanding working relationship with their utility company and felt most comfortable doing their project with a known partner.

ESPC ENABLE is a pilot project funding program intended to accommodate agencies with multiple small sites. ESPC ENABLE is a standardized process for several most cost-effective ECMs. This standardized

approach is anticipated to speed up the process significantly, allowing agencies to award task orders in 12-15 weeks. The program encourages the bundling of an agency’s multiple sites/buildings/facilities in a single project or procurement.

For more information on ESPC ENABLE, contact:

Chip Goyette

ESPC Process Improvement

202-586-9209

chip.goyette@ee.doe.gov

U.S. DEPARTMENT OF **ENERGY** | Energy Efficiency & Renewable Energy

For More Information on Financing Options for Energy Projects

- Ask a FEMP Financing Specialist
- On-Demand FEMP Webinar: Alternative Financing Options
 - Go to FEMP → Project Funding → ESPCs → Training
- See “Alternative Financing Option Matrix” on FEMP Web – ESPC Resources page
 - Go to FEMP → Project Funding → ESPCs → Resources

A-20

Federal Energy Management Program | femp.energy.gov

U.S. DEPARTMENT OF **ENERGY** | Energy Efficiency & Renewable Energy

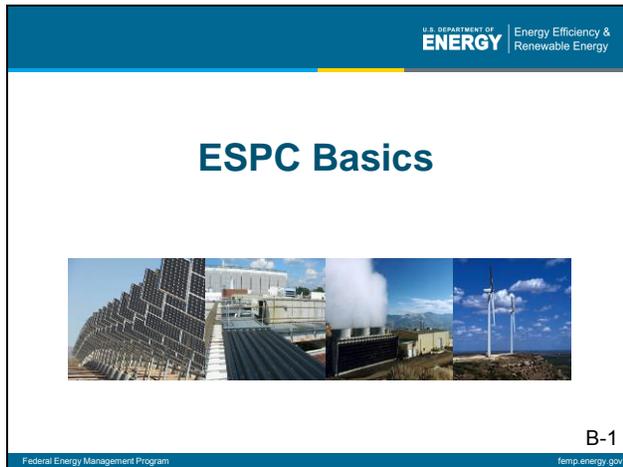


Next: **Module B, ESPC Basics** ►

A-21

Federal Energy Management Program | femp.energy.gov

B – ESPC Basics



U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

What are ESPCs?

- The ESCO:
 - Provides design, acquisition, financing, installation, testing, operation, and where appropriate, maintenance and repair, of ECMs
 - Incurs the costs of implementing the ECMs, including energy audits, acquiring and installing equipment, and training personnel
 - In exchange for a share of the resulting savings during the term of the contract
 - Guarantees cost savings to the Government.
- The customer (agency/site)
 - Pays the ESCO over the term of the contract out of the savings resulting from the project.

B-2
Federal Energy Management Program | femp.energy.gov

What are ESPCs?

Contracts that allow agencies to procure facility improvements with no up-front capital cost and without special appropriations from Congress.

Federal Acquisition Regulation 2.101 –

Energy-savings performance contract means a contract that requires the contractor to—

ESCO:

- (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.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Key Features of ESPCs

- Purpose: Achieve energy savings & ancillary benefits
- Flexible funding – private financing & appropriated funds
- No agency payments until new equipment is operating
- Cost savings are guaranteed to exceed payments
- Performance of ECMs is guaranteed
- ESCO may perform Operations & Maintenance (O&M)
- Measurement & Verification (M&V) is required
- Maximum term 25 years

B-3

Federal Energy Management Program femp.energy.gov

Note that COs often define “performance” as simply construction, but Federal ESPC task orders, by law, include guarantees of cost savings and equipment performance, including specified standards of service (e.g., humidity levels, temperatures in occupied spaces).

- Purpose: Achieve energy savings & ancillary benefits
- Funding by any combination of private financing & appropriated funds is authorized
- No agency payments until new equipment is operating
- Cost savings are guaranteed to exceed payments
- Performance of energy conservation measures (ECMs) is guaranteed
- ESCO often performs Operations & Maintenance
- Measurement & Verification is required
- Maximum term 25 years
- Agencies may not arbitrarily limit terms for their sites to under 25 years, per EISA 2007

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

ESPCs are Budget-Neutral

Reallocate the Government’s Utility Bill:
 ♦ Stop paying for waste and pollution ♦ Start paying for efficiency ♦

B-4

Federal Energy Management Program femp.energy.gov

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

ESPC Authorities

- National Energy Conservation Policy Act, Title VIII Shared Energy Savings (1986)
- Energy Policy Act of 1992 (EPACT 1992)
- DOD Authorization Act 2004
- Energy Policy Act of 2005 (EPACT 2005)
- Energy Independence & Security Act (EISA 2007) (42 USC 8287 – ESPC statutory authority)
- 10 CFR 436 Subpart B – Implementing Regulations
- National Defense Authorization Act FY11 (applies to all DOD and civilian agencies)
- Federal Acquisition Regulations Part 23
- Executive Order 13423

B-5

Federal Energy Management Program femp.energy.gov

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

Federal Energy Goals – Sustainability & Energy – EISA, EO 13423, EO 13514

- Reduce facility energy use by 30% (relative to 2003) by end of 2015
- Increase use of renewable energy to 7.5% by 2013
- Reduce water use by 16% by end of 2015 (relative to 2008) and 26% by 2020
- Reduce direct greenhouse gas emissions
- Meet Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings for at least 15% of buildings >5,000 sq ft by 2015
- <http://www1.eere.energy.gov/femp/pdfs/sustainabilitycrosswalk.pdf>

B-6

Federal Energy Management Program femp.energy.gov

EISA 2007, EO 13423, and EO 13514 have expanded and increased requirements to measure, report, and reduce energy use. Some of the major goals are summarized below:

- Reduce facility energy use by 30% (relative to 2003) by end of 2015
- Increase use of renewable energy to 7.5% by 2013
- Reduce water use by 16% by end of 2015 (relative to 2008) and 26% by 2020
- Reduce direct greenhouse gas emissions (from fuels and building energy use) by 28% by 2020, and indirect emissions (from employee business travel and commuting) by 13% by 2020
- Meet Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings for at least 15% of new, existing, and leased buildings >5,000 sq ft by 2015

A “Crosswalk of Sustainability Goals and Targets” is available on FEMP’s Web site at <http://www1.eere.energy.gov/femp/pdfs/sustainabilitycrosswalk.pdf>.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

What Are The Benefits of Using ESPCs?

- Fund energy improvements with minimal or no up-front capital costs
 - Preserve appropriations for other needs
- Obtain long-payback ECMs by bundling with short-payback ECMs
- Operations, maintenance & repair can be included in contract
- Take advantage of ESCO experience
- They deliver guaranteed improvements, savings, and performance

B-7

Federal Energy Management Program femp.energy.gov

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Use ESPCs to Reduce Government Risk

- Fixed-price contract reduces price risk on design-build project
- Performance guarantees reduce equipment performance risk
- Mandatory M&V reduces energy savings risk
- New equipment may enhance energy security
- Reducing energy use reduces impact of future utility price hikes

B-8

Federal Energy Management Program | femp.energy.gov

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Flexible Funding —

- Authorization
- Strategic Use of Appropriations & Financing



B-9

Federal Energy Management Program | femp.energy.gov

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Authorization for Combining Financing and Appropriations in ESPCs

- EISA 2007 §512
 - May use any combination of appropriated funds and private financing under an ESPC
 - EISA 2007 §432 reinforces authorization for “combined funding for the same measure”
- NECPA (42 U.S.C. § 8287a) still applies:
 - ESPC payments may come only from funds appropriated or otherwise made available for the payment of energy, water, or wastewater treatment expenses (and related O&M/R&R expenses).

B-10

Federal Energy Management Program | femp.energy.gov

EISA § 432 reinforces the authorization for agencies to combine financing and appropriations in energy projects:

10 (B) **FUNDING OPTIONS.**—

(i) **IN GENERAL.**—To carry out this subsection, a Federal agency may use any combination of—
(I) appropriated funds made available under subparagraph (A); and
(II) private financing otherwise authorized under Federal law, including financing available through energy savings performance contracts or utility energy service contracts.

(ii) **COMBINED FUNDING FOR SAME MEASURE.**—A Federal agency may use any combination of appropriated funds and private financing described in clause (i) to carry out the same measure under this subsection.

The National Energy Conservation and Policy Act (NECPA), 42 U.S.C. § 8287a, still applies:

“Any amount paid by a Federal agency for an ESPC may be paid only from funds appropriated or otherwise made available to the agency . . . for the payment of energy, water, or wastewater treatment expenses (and related operation and maintenance expenses).”

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

ORNL Study: Quantitative comparison of three options for use of appropriated funds in energy management:

1. Directly fund short-payback ECMs
2. Directly fund long-payback ECMs (that do not fit into a financed project)
3. Apply as one-time up-front payment to reduce financed amount

B-11

Federal Energy Management Program femp.energy.gov

This ORNL study by John Shonder, *Mixing Appropriations and Private Financing to Meet Federal Energy Management Goals*, ORNL/TM-2012/235, is available at http://www.ornl.gov/sci/ees/etsd/btrc/publications/ORNL%20TM%202012_235.pdf.

It is also linked from <http://www.ornl.gov/sci/ees/etsd/btrc/espc.shtml> (the first link under the *Publications* heading).

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Study Conclusions

- Best strategy
 - Use private financing to fund as many measures as possible, starting with shortest paybacks
 - Use available appropriations as up-front payment for financed project
- Directly funding short-payback ECMs with appropriations is not a good strategy –
 - Limits investment, limits savings, costs more, limits agency's options

B-12

Federal Energy Management Program femp.energy.gov

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Our Focus Today: TOs Under the DOE-FEMP IDIQ* ESPCs

- IDIQ contracts awarded competitively by FEMP to streamline the process / tap private-sector expertise
- Agencies award task orders (TOs) under the IDIQs
- Can be used for federally owned agency facilities anywhere in the world
- Scope includes energy conservation measures A – Z

*Indefinite-delivery, indefinite-quantity



B-13

Federal Energy Management Program femp.energy.gov

The DOE-FEMP IDIQ ESPCs were awarded competitively to ESCOs by FEMP to streamline to streamline the ESPC process for agencies.

Agencies negotiate, award, and administer task orders under these IDIQs.

Scope of contract: Any of 16 ESCOs that have been awarded DOE-FEMP ESPC master IDIQs can do projects for federally owned facilities anywhere in the world.

However, status-of-forces agreements that apply to facilities outside the United States in some cases affect the options for placing ESPC task orders.

- **Scope Covers Energy Conservation Measures (ECMs) from A to Z**

- Boiler and chiller plants
- Energy management control systems
- Building envelope
- HVAC
- Chilled/hot water and steam distribution
- Lighting
- Electric motors/drives
- Refrigeration
- Distributed generation
- Renewable energy
- Energy/utility distribution
- Water and wastewater
- Electrical peak shaving/load shifting
- Rate adjustments
- Energy-related process improvements
- Commissioning
- Advanced metering
- Appliance/plug load reductions

Milestones in the ESPC Process

• Acquisition Planning	Phase 1
• ESCO Selection	2
• Preliminary Assessment	2
• Notice of Intent to Award	2
• Request for Proposal	3
• Investment-Grade Audit	3
• Proposal	3
• Task Order Award	3
• Final Design and Construction	4
• Project Acceptance	4
• Post-Acceptance Performance Period	5

14

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

15 Years of DOE IDIQ ESPC Results (1998-2012)*

- 278 FEMP ESPC projects have been awarded by 25 agencies
- Total project investment: \$2.68B
- Total savings: \$7.1B
- Energy savings: 347 million MMBtu
*Statistics as of Nov 2012
- M&V annual reports show that 105% of guaranteed cost savings were reported



B-15

Federal Energy Management Program femp.energy.gov

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

FEMP ESPC Contacts

<p>FEMP Federal Financing Specialists (FFS's)</p> <p>Doug Culbreth Southeast Region plus Europe and Western Hemisphere 919-870-0051 carson.culbreth@ee.doe.gov</p> <p>Tom Hattery Northeast Region plus State Dept. 202-256-5986 thomas.hattery@ee.doe.gov</p> <p>Scott Wolf Western Region including N. Marianas, Palau, Guam, American Samoa; plus East, South, and Central Asia; the Pacific; and Near East 360-866-9163 scott.wolf@ee.doe.gov</p>	<p>DOE Golden Office – DOE IDIQ Contract Administration</p> <p>Wayne Latham, Contracting Officer 720-356-1507 Wayne.Latham@go.doe.gov</p> <p>Email address for all ESPC contracting-related questions: FEMP@go.doe.gov</p> <p>Greg Moore Contracting Officer's Representative 720-356-1725 Greg.moore@go.doe.gov</p> <p>Randy Jones Alternate Contracting Officer's Rep 720-356-1667 randy.jones@go.doe.gov</p>
---	--

B-16

Federal Energy Management Program femp.energy.gov

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Keep In Mind

- Opportunity cost is our enemy—keep the big picture in mind.
 - Inaction is very costly
 - Delay is costly especially with financed project
- Despite training, you're not on your own!
 - FEMP team supports every project
- Keep DOE-FEMP on speed dial
 - We're never far away
 - We have an interest in every project throughout term

B-17

Federal Energy Management Program femp.energy.gov

Common Sense

The experience of FEMP's ESPC team has proven the following as best practices:

- Read and understand the contract. You'll be glad you did.
- Avoid problems by build institutional knowledge and expertise in all areas into your acquisition team.
- Maintain as much continuity as possible in government and ESCO teams throughout project development, construction, and performance

period.

- Most project delays are caused by the government. Commit the resources necessary to keep your project on track.
- Look ahead to the performance period during project development. Make sure the M&V plan and the government responsibilities defined in the contract are acceptable and doable.



C – Phase 1, Acquisition Planning

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Phase 1: Acquisition Planning Set the stage for a successful project

Phase 1

Phase 2:
ESCO Selection – Preliminary Assessment

Phase 3:
Investment-Grade Audit (IGA) to Award

Acquisition Planning

Months

1
2
3
4
5
6
7
8
9
10
11
12

- ★ Get started with FEMP Federal Financing Specialist (FFS)
- ★ Engage Project Facilitator
- ★ Assemble Agency Acquisition Team
- ★ Consider project motivations and site needs
- ★ Develop Acquisition Plan
- ★ Determine appropriate approval levels
- ★ Determine ESCO selection procedures
- ★ Define project requirements

Federal Energy Management Program
femp.energy.gov

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

The FEMP Financing Specialist (FFS) helps with project preliminaries:

- Determining whether “pay-from-savings” project is feasible
- Educating staff and developing agency support for project
- Determining what kind of project support is needed within agency

C-2
 femp.energy.gov

The DOE Federal Energy Project Financing Specialist (FFS) is DOE’s coordinator of the ESPC process in the first phase of project development. With the FFS’s help, the agency focuses on the following objectives in Phase 1:

- Determining whether a “pay-from-savings” project is feasible
- Educating agency staff about ESPCs
- Developing support in the agency needed to initiate a project and see it through in a timely manner
- Establishing the preliminary scope and goals for the project

17

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

FEMP Support and Project Facilitators (PFs)

- Engaging the services of a DOE-qualified Project Facilitator is required
 - FEMP assistance (FFS and PF) is provided free to agency through preliminary assessment review and Notice of Intent to Award
 - After that, FFS will help set up an Interagency Agreement (IAA) for continuing PF services
 - A sample statement of work for PFs and IAA are on FEMP’s ESPC Resources Web page

C-3

Federal Energy Management Program | femp.energy.gov

Agencies must use a qualified Project Facilitator (PF) when using the DOE ESPCs to place a task order. For services provided by the PF after the Notice of Intent to Award, agencies reimburse DOE through an interagency agreement (IAA) between DOE and the ordering agency.

The FFS helps the agency determine what services will be needed from a PF and execute the IAA.

Agencies may pay for PF services under several different payment plans. Some agencies include this expense in the ESPC and pay for them as part of the ESPC project.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

DOE Golden Office Guidance on Acquisition Planning

- FAR Part 7 requires acquisition planning for all acquisitions.
- ESPC task orders are not exempt.
- Acquisition planning ensures that the government meets its needs in the most effective, economical, and timely manner.

C-4

Federal Energy Management Program | femp.energy.gov

DOE Golden Field Guidance on ESPC Acquisition Planning

A *written* acquisition plan, along with proper file documentation, is an important part of the ESPC procurement. Each element of the acquisition plan should address the ESPC approach.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Important Elements of a Written Acquisition Plan

✓ Statement of Need	✓ Source-selection procedures*
✓ Applicable Conditions	✓ Budgeting and Funding
✓ Cost	✓ Management Information Requirements
✓ Capability or Performance	✓ Miscellaneous Considerations
✓ Delivery or Performance Period Requirements	✓ Government Furnished Property and Information
✓ Trade-offs	✓ Contract Administration
✓ Risks	✓ Milestones for the Acquisition Cycle
✓ Sources	
✓ Competition*	

C-5

Federal Energy Management Program | femp.energy.gov

Proven best practices include the following.

- ✓ Get all of the appropriate individuals involved in the project early.
- ✓ Obtain “buy-in” from management.
- ✓ Support the ESCO selection decision.
- ✓ Provide information to support debriefings.
- ✓ Avoid possible protests.
- ✓ Document entire process for audits.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Assemble an Acquisition Team

- Everyone who could help or hinder (or be affected by) project should be invited, e.g.:
 - **Contracting officer & site technical representative**
 - Facility manager and facility maintenance staff
 - Energy, design, and construction engineers
 - Procurement and legal staff
 - Budget/comptroller representative
 - Union reps, labor relations
 - Agency customers and tenants
 - Environment, health, safety
 - Security representative



Federal Energy Management Program femp.energy.gov

C-6

The acquisition team steers the agency's efforts in developing the project, builds support for the project inside the agency, and obtains the necessary management approvals. The team should include (or consult with) anyone who could potentially have a significant impact on progress toward awarding a delivery order. The makeup and commitment of the team is an important determining factor in the success or failure of a project.

The acquisition team must include at least the agency contracting officer and a site technical representative, or contract officer's technical representative (COTR), who serves as the principal point of contact on technical issues. The acquisition team should represent all organizations that are affected by or should be consulted about project.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

The Acquisition Team – Roles and Strategy

- Develop acquisition plan
- Create and implement a plan to achieve objectives
 - Define team roles
 - Build site & agency support for project
 - Educate other staff and tenants about the project, the process, and benefits of ESPCs
 - Encourage members to attend ESPC webinars and/or workshop
 - Who's your champion?
 - Keep everyone on track, keep process moving forward
- Assure (with DOE help) a good deal

Federal Energy Management Program femp.energy.gov

C-7

The acquisition team steers the agency's efforts in developing the project, builds support for the project inside the agency, and obtains the necessary management approvals.

The acquisition team should be designated, on-board, and educated about ESPC rules and benefits early in the process. As early as possible and throughout the process, acquisition team members should identify the agency decision makers who have the authority to approve a ESPC project, educate them about the ESPC program, familiarize them with the site's project plans, and ensure that they have all the information they need to approve the project.

Lack of an acquisition team and the support of upper management can severely impede or entirely halt the process after significant resources have been expended by the agency and the ESCO.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

The Acquisition Team Establishes Project Requirements (in broad strokes):

- Priority objectives for the project (e.g., meet energy goals, or replace failing equipment)
- Which buildings/facilities
- Must-have ECMs
- “Wish list” ECMs

C-8

Federal Energy Management Program | femp.energy.gov

Before moving into the next phase of the ESPC process – ESCO Selection – the agency acquisition team will need to establish basic project requirements: which buildings or facilities should be included in the project, the agency/site’s main objectives for the project (e.g., meeting energy goals, or replacing obsolete HVAC systems), must-have ECMs, and perhaps other important parameters

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Considerations in Defining Project Requirements

- Future use of facilities
 - Ten-Year Site Plans
- Other planned construction
- Site needs and priorities based on
 - Command/upper management priorities
 - Condition of equipment
 - Feedback from employees/building occupants
- Site budget for utilities and energy-related equipment and O&M
- Unique agency- and site-specific issues

C-9

Federal Energy Management Program | femp.energy.gov

Issues to be Addressed by Acquisition Team

The acquisition team will need to consider the issues listed below, along with others more specific to the candidate site, when considering or planning an ESPC project.

Future use of the facilities — An agency might not want to pursue an ESPC project at a facility that could be closed down during the performance period of the task order.

Needs and desires of facility occupants – Are there problems with keeping the area at a comfortable temperature or problems meeting environmental requirements? These types of concerns by agency

employees would motivate an organization to work hard to help an ESPC succeed.

Condition of existing equipment — Is the equipment old and unreliable so that it will require replacement or major repairs soon?

Utility budget and energy-related equipment and O&M budget — Is the annual utility budget large enough to attract an ESPC proposal (greater than \$500K), and is it stable, or increasing in size? Are there any energy upgrade projects or service contracts that could be transferred to the ESPC?

Scope — What areas or facilities may be included in the task order?

Energy conservation measures — What ECMs would the agency consider for a project? How could the agency bundle them for a better project?

Potential savings both in energy units and dollars — Are dollar savings large enough to attract an ESCO and provide a payback period which would be acceptable to the agency?

M&V approach — Are there any special agency desires that should be considered? Are there barriers that might impede certain M&V approaches (e.g., lack of building-level meters or an electronic energy-management system)?

Conflicts with current or pending construction projects

Obstacles — Are there barriers to a project, such as security issues, union issues, or management attitudes, that would make a task order unworkable?

Other issues — What do the managers of these facilities need to do to support the project? Where will the ESCO have on-site space and who is in charge of it? Are agency subcontractors involved on site? Are there other contractual arrangements in place that might be affected by an ESPC project?

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Obtaining Required Reviews/Approvals

- Identify early the decision makers – at all levels – who have authority to approve the project
 - Educate decision makers about ESPC
 - Ensure they have all info they need
- Determine
 - when briefings must occur
 - what documents are required
 - who has signing authority
- Prepare for business clearance review concurrently with other process steps
- This is critical to keeping the project on track and preventing delays

C-10

Federal Energy Management Program femp.energy.gov

Clearance reviews are a required feature of government contracting, but contracting staff can manage the process so that they do not slow down the process or take undue staff time. Contracting staff can manage the required clearance reviews at the same time as they oversee the ESPC project development process. Higher-level leadership or HQ reviews must also be considered.

During the acquisition planning stage team members representing various organizational units should research and identify when briefs have to occur, who has signing authority, and what documents will need to be provided.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Level of Required Agency Effort Varies

- Factors include:
 - ESPC experience on acquisition team
 - Project complexity and size
 - Agency approval process
- Contracting officer and energy/facility manager will carry most responsibility
 - Other acquisition team members engaged as needed, when needed

C-11

Federal Energy Management Program femp.energy.gov

Doing a thorough job of this will identify which processes don't actually culminate in "approvals," but rather concurrences, so that they don't delay project development. Being prepared for these reviews and knowing what documents are required to be presented and what is required to be documented will allow the project to keep moving forward.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Rough Estimates of ESPC Effort

- To award task order
 - Energy/facility manager: 2-5 full-time employee (FTE) mos.
 - Contracting office: 1-3 FTE mos.
- Construction, commissioning, post-installation M&V
 - Mostly energy/facility manager
 - Time needed varies widely with project complexity and site requirements
 - Typical agency construction/acceptance process
- Contract admin. through first-year M&V
 - ~1 FTE mo. (combined CO and COR)

C-12

Federal Energy Management Program femp.energy.gov

The level of agency resources required to develop an ESPC project is usually inversely proportional to the agency's ambition for project success. Costs are minimized when the organization is wholly committed to achieving a successful project. Lack of buy-in from site management or acquisition team members' managers can result in backtracking and other unproductive activities that occupy staff time without producing any progress.

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Best Practices for Achieving TO Award in 12 Months – Prepare Your Team

- Project Champion — Identify a team champion/agency project manager who will keep the project on track. The champion/project manager educates the project team and stakeholders early and often.
- ESCO — Select using Selection Based on Qualifications process.
- Acquisition Team — Assign clear roles and responsibilities and commit to an award schedule, using the 12 month project cycle as the starting point.

C-13

Federal Energy Management Program | femp.energy.gov

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Best Practices for Achieving TO Award in 12 Months – Prepare Your Team (continued)

- Management — Ensure that the management team is fully briefed and supportive of the ESPC Team at each stage, with management's issues/priorities addressed.
 - Management commitment to meet review and approval timelines
 - Management commitment to allocate resources in support of project

C-14

Federal Energy Management Program | femp.energy.gov

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Best Practices for Achieving TO Award in 12 Months – Tools and Resources

- Tools and Resources – Use FEMP resources and experts (PF, FFS, DOE GO, labs)
 - With the experts' help, use streamlined and standardized processes, e.g., FEMP templates or other Agency process, for consistency and efficiency.

C-15

Federal Energy Management Program | femp.energy.gov

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

NEXT: Module D

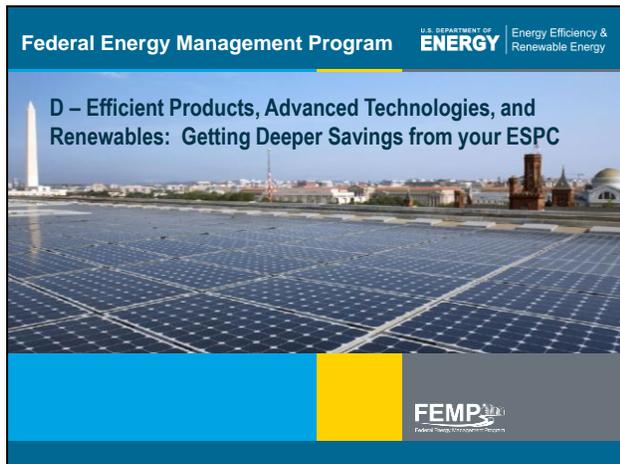
Efficient Products, Advanced Technologies, and Renewables: Getting Deeper Savings from your ESPC



C-18

Federal Energy Management Program | femp.energy.gov

D – Efficient Products, Advanced Technologies, and Renewables: Getting Deeper Savings from your ESPC



Overview

- **Objective:**
 - Achieve maximum energy savings from your ESPCs
- **Steps: Agency initiates discussion w/ESCO**
 - Ensure contracts meet minimum purchasing requirements
 - ENERGY STAR® and FEMP-Designated product specifications
 - Achieve deeper savings through underutilized technology
 - FEMP Technology Deployment Matrix
 - Incorporate renewables
 - Renewable energy screenings
 - Power purchase agreements

D-2

2 | Federal Energy Management Program eere.energy.gov

Agencies should bring their ideas about renewables or other non-standard ECMs to the ESCO.

Milestones in the ESPC Process

• Acquisition Planning	Phase 1
• ESCO Selection	2
• Preliminary Assessment	2
• Notice of Intent to Award	2
• Request for Proposal	3
• Investment-Grade Audit	3
• Proposal	3
• Task Order Award	3
• Final Design and Construction	4
• Project Acceptance	4
• Post-Acceptance Performance Period	5

D-3

During acquisition planning is the time for agencies to consider ECMs “outside the box” that can maximize energy savings or provide other desired benefits.

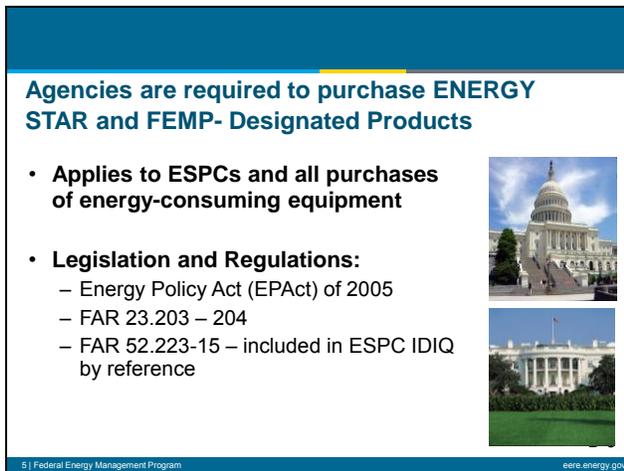
Agencies should not wait for ESCOs to bring these ideas to them, because the ESCO’s experience may have been that agency customers are not interested in non-standard ECMs.

Agencies who are interested in renewables or newer technologies should do their research early and be prepared to bring these ideas to the ESCO(s).



Federal agencies are required by legislation and regulations to purchase energy-efficient products and equipment. It is important for both the ESCO and agency to be aware of these rules when developing an ESPC project. The FEMP-Designated Product specifications and EnergyStar label set the Federally mandated minimum for agencies purchasing energy-consuming products. Products incorporated in ESPCs should typically be exceeding those standards.

ESCOs will be responsible for ensuring that equipment procurement for agency ESPC projects complies with these rules and documenting their compliance in the investment-grade audit report. The agency is responsible for verifying compliance as represented by the ESCO, usually with assistance from the project facilitator. DOE will also be reviewing DOE IDIQ ESPC projects for compliance with energy-efficient product procurement rules.



The requirements for procuring ENERGY STAR and FEMP-designated products when procuring energy-consuming products stem from 42 U.S.C. 8259b, and are part of the DOE ESPC IDIQ.

These requirements are reinforced by FAR Part 23.203 – 204, which in addition states that for products that consume power in a standby mode, agencies are required to buy those listed on FEMP’s Low Standby Power Devices Product Listing.

The DOE ESPC IDIQ includes FAR 52.223-15, which passes the procurement requirements for FEMP-Designated and Energy Star products on to the contractor. It reads:

FAR 52.223-15

ENERGY EFFICIENCY IN ENERGY-CONSUMING PRODUCTS (DEC 2007)

(a) *Definition.* As used in this clause—

"Energy-efficient product"—

(1) Means a product that—

(i) Meets Department of Energy and Environmental Protection Agency criteria for use of the Energy Star® trademark label; or

(ii) Is in the upper 25 percent of efficiency for all similar products as designated by the Department of Energy's Federal Energy Management Program.

(2) The term "product" does not include any energy-consuming product or system designed or procured for combat or combat-related missions (42 U.S.C. 8259b).

(b) The Contractor shall ensure that energy-consuming products are energy efficient products (i.e., ENERGY STAR products or FEMP-designated products) at the time of contract award, for products that are—

- (1) Delivered;
- (2) Acquired by the Contractor for use in performing services at a Federally-controlled facility;
- (3) Furnished by the Contractor for use by the Government; or
- (4) Specified in the design of a building or work, or incorporated during its construction, renovation, or maintenance.

(c) The requirements of paragraph (b) apply to the Contractor (including any subcontractor) unless—

- (1) The energy-consuming product is not listed in the ENERGY STAR Program or FEMP; or
- (2) Otherwise approved in writing by the Contracting Officer.

(d) Information about these products is available for—

- (1) ENERGY STAR at <http://www.energystar.gov/products>; and
- (2) FEMP at www.femp.energy.gov/technologies/eep_purchasingspecs.html.

(End of clause)

Summary of Requirements

- **Agencies must purchase ENERGY STAR and FEMP-designated products**
 - ESCOs are aware, but agencies should ensure compliance
- **Applies to all products covered by the two programs (~ 90)**
- **Exemptions (with written determination by agency head) only when there is no ENERGY STAR or FEMP-designated model that:**
 - Meets the agency's functional requirements
 - Is life-cycle cost-effective for application

D-6

6 | Federal Energy Management Program eers.energy.gov

This slide summarizes the requirements for purchasing energy-efficient products.

The requirements apply to products and equipment purchased through any agency procurement action, including those purchased:

- directly by agencies from Federal supply agencies and commercial sources,
- indirectly through acquisitions carried out under construction, renovation, or services contracts, and individually through Government credit cards.

Exceptions to these requirements are allowed only if:

- no ENERGY STAR qualified or FEMP-Designated product is cost-effective over the life of the product, or
- no ENERGY STAR qualified or FEMP-Designated product is reasonably available that meets the agency's functional requirements.

In such cases, the head of the agency must find in writing that such an exception is warranted.

EPAct 2005 also directs the General Services Administration and the Defense Logistics Agency to supply only ENERGY STAR or FEMP-Designated products unless written justification is received from the requesting agency to supply an alternative product. This justification must meet the exception criteria above.

Ensuring Compliance

- Make sure to discuss the requirements with the ESCO early in ESPC process
- Check the FEMP website to see which product types are covered
- Review spec sheets in ESCO's proposal to check whether specified models meet efficiency requirements

```

    graph TD
      A[1. Look up the FEMP-designated efficiency requirement] --> B[2. Get a copy of the spec sheet]
      B --> C[3. Compare the spec sheet to the efficiency requirement - is it compliant?]
      C --> D[Yes - go ahead and buy it!]
      C --> E[No - find another model or write a justification]
    
```

7 | Federal Energy Management Program eere.energy.gov

See FEMP's Web site for more information on the requirements and tools and resources from the Energy-Efficient Product Procurement program.

From the FEMP home page, go to *Technologies*, for links to Federal requirements and other resources. www.femp.energy.gov/technologies/procuring_ee_products.html

What To Do

- Look up the FEMP-designated efficiency requirement
- Get a copy of the spec sheet
- Follow the checklist

Checklist

a) Is it the right product type? (EX: water heater)

- Commercial?
- Gas?
- Storage, instantaneous, or hot water supply boiler?

b) Does it meet or exceed the FEMP-designated efficiency requirement?

8 | Federal Energy Management Program eere.energy.gov

Look up the FEMP-Designated Efficiency Requirement

- Visit www.FEMP.energy.gov/coveredproducts

9 | Federal Energy Management Program eere.energy.gov

Is the product category covered?

- Select the product type

If it appears on this website, it's covered by either FEMP or ENERGY STAR

10 | Federal Energy Management Program eere.energy.gov

Find the Efficiency Requirements Table

FEMP Designated Product: Commercial Gas Water Heaters

Performance Requirements for Federal Purchases

Product Type	Rate Input (Btu/h)	Thermal Efficiency*
Storage ¹	75,000 or greater	84% or greater
Instantaneous ²	200,000 or greater	84% or greater
Hot Water Supply Boiler ³	100,000 to 12,500,000	84% or greater

* Thermal efficiency is the ratio of heat transferred to water flowing through the water heater to the amount of energy consumed by the water heater as measured by the thermal efficiency test procedure contained in ANSI Z21.10.3-1999.

¹ A self-contained unit that heats and stores water within the appliance at thermostatically-controlled temperature for delivery upon demand.

² A water heater with an input rating of at least 4,000 British thermal unit per hour (Btu/h) of stored water.

³ A packaged boiler with an input rating from 300,000 to 12,500,000 Btu/h (at least 4,000 Btu/h per gallon of water stored) and is intended for heating potable water.

11 | Federal Energy Management Program eere.energy.gov

Get a copy of the spec sheet

How? Spec sheets should be included as part of the contractors proposal

This example was downloaded from a manufacturer website and *is not a product endorsement.*
http://www.americanwaterheaternews.com/media/lit/polaris/Polaris_Commercial_Spec_sheet.PDF

12 | Federal Energy Management Program eere.energy.gov

Compare spec sheet to FEMP-designated efficiency requirement

FEMP Designated Product: Commercial Gas Water Heaters

Performance Requirements for Federal Purchases		
Product Type	Rate Input (Btu/h)	Thermal Efficiency ¹
Storage ^a	75,000 or greater	94% or greater
Instantaneous ^a	200,000 or greater	94% or greater
Hot Water Supply Boiler ^a	300,000 to 12,500,000	94% or greater

13 | Federal Energy Management Program eere.energy.gov

Achieving Deeper Savings: Advanced and Underutilized Technology

D-14

Agencies should bring their ideas about renewables or other non-standard ECMs to the ESCO.

Agencies should not wait for ESCOs to suggest renewables or other non-standard ECMs to them, because the ESCO's experience may have been that agency customers are not interested in non-standard ECMs. Agencies who are interested in renewables or newer technologies should be prepared to bring these ideas to the ESCO(s).

Benefits of Including Advanced EE and RE Technologies in ESPCs

- Financing of up-front costs
- Better access to rebates and tax incentives
- Performance guarantees
- A partner (the ESCO) who is also invested in the success of the technology
- FEMP assistance and resources, including experts from DOE national labs

D-15

15 | Federal Energy Management Program eere.energy.gov

ESPCs have been proven to be an excellent vehicle for procuring and deploying energy efficient and/or advanced technologies for Federal facilities. The DOE ESPC vehicle provides guaranteed savings and performance, and also allows any perceived risk associated with deploying “new” technologies to be appropriately allocated between the ESCO and a motivated customer agency.

FEMP's assistance with identifying, researching, and deploying advanced energy efficient and renewable energy (EE & RE) ECMs gives agencies the advantage of having reliable, unbiased information and expertise to help them choose ECMs that meet their needs and deliver high value.

The Technology Deployment Matrix

- Lists ~ 50 new/underutilized technologies with good potential for success in ESPCs or UESCs
- Links to technology reviews
- Saves research time and provides reliable information for choosing ECMs

Navigation to the Technology Deployment Matrix:
FEMP → *Technologies* → *Technology Deployment* → *Technology Deployment List*

D-16

16 | Federal Energy Management Program eere.energy.gov

The Technology Deployment Matrix includes information on promising emerging and underutilized technologies in the following technology categories:

- Building envelope
- HVAC
- Lighting
- Water heating
- Combined heat and power
- Refrigeration
- Computer power management

Categories of Technologies in Matrix

- Building envelope
- HVAC
- Lighting
- Water heating
- Combined heat and power
- Refrigeration
- Computer power management

D-17

17 | Federal Energy Management Program eere.energy.gov

Note that interest in combined heat and power (CHP) is growing among Federal energy managers and at FEMP. The recent drop in the price of natural gas has significantly improved the feasibility of natural-gas-fueled CHP systems.

A CHP system recovers otherwise wasted heat from electricity generation for productive uses such as heating, cooling, and dehumidification. Properly designed CHP systems can be more than twice as efficient as the average U.S. fossil fuel power plant. Industrial processes, research and development activities, and service activities that involve heating and cooling are all candidates for CHP.

Top Ten in Technology Deployment Matrix

Rank	Technology	Category	Weighted Score
1	Spectrally Enhanced Lighting	Lighting	91
2	Condensing Boilers	HVAC	86
3	Combined Heat and Power	Power Generation	85
4	Super T8 Lighting	Lighting	79
5	Low Ambient / Task Lighting	Lighting	68
6	Commercial Ground-source Heat Pumps	HVAC	66
7	High R-Value Windows	Building Envelope	65
8	Duct Sealants	HVAC	63
9	LED / Solid State Lighting - Interior	Lighting	61
10	LED / Solid State Lighting - Exterior	Lighting	59

D-18

18 | Federal Energy Management Program eere.energy.gov

This is the current overall top 10 technologies in the Technology Deployment Matrix, as ranked by three criteria:

Federal impact (50%), cost effectiveness (30%), and probability of success (20%).

Note that combined heat and power (CHP, or cogeneration) is third on the list.

These are not necessarily the newest or most advanced technologies, but rather the technologies that have the potential to make the biggest impact on the Federal building portfolio through their incorporation in ESPCs, UESCs, or other financed procurements.

How to Use the Technology Deployment Matrix During ESPC Development

- **As part of acquisition planning, agencies review the matrix for opportunities**
 - If you don't hear about the matrix early in project development, ask your PF or FFS
- **FEMP can schedule a meeting with the agency to go over matrix**
 - Bringing the ESCO into the discussion can speed incorporation

D-19

19 | Federal Energy Management Program

eere.energy.gov

Your FFS or PF will likely bring the list to your attention during early project development. It should be reviewed with your FFS, PF, and/or others FEMP team members with technology deployment expertise before the preliminary assessment, during which initial estimates of ECM feasibility and savings potential are completed by the ESCO.

FEMP Federal Financing Specialists and project facilitators typically review these technologies with the participating agency to assist with the selection and procurement. Energy service companies (ESCOs) and utility companies are often invited to speed plan development.

Advanced/Underutilized Technologies in ESPCs

- Outdoor LED Lighting: Army, GSA, DOE, USCG
- Induction Lighting: Army, GSA, USCG
- Roof Integrated PV: GSA
- EE Fume Hoods: DOE (LANL, ORNL, NETL), USFS
- Variable Refrigerant Volume (VRV) A/C: USCG, USAF
- LED Runway Lights: USCG, FAA
- Turbocor Chillers: USDA, GSA, USCG, NASA
- Aerosol Duct Sealing: Arch. of Capitol (U.S. House of Reps.)
- Biomass Cogen/Boilers: NETL, NREL, ORNL, BoP, DOE
- Bay Source Heat Pumps: FDA
- Cool/Green Roof: DOE, GSA, USGS, USCG
- Wind power: USFS, GSA, DOE

D-20

20 | Federal Energy Management Program

eere.energy.gov

As illustrated by the list in the slide, a wide range of advanced or under-utilized EE/RE ECMs have been deployed in agencies' ESPC projects. As agencies' experience with these technologies grows, many of them are making the transition from the "under-utilized" category into the mainstream Federal markets.

Keys to Successful Deployment

- **Agency initiative and motivation is important**
- **Technologies may be identified by agency or ESCO**
 - Agency suggestion increases likelihood of incorporation
- **Projects require a mix of motivation and tolerance among project partners**
 - Each partner must be motivated to incorporate the technology – or at least tolerant of it
- **Perceived risks need to be identified and managed**
 - For instance, how should M&V be handled for technology that's only been commercialized for 5-10 years?

D-21

21 | Federal Energy Management Program

eere.energy.gov

Experience in deploying these technologies has shown that success depends largely on the agency's motivation and initiative. If the agency is motivated to take advantage of less common technologies with high potential for savings, then the challenges of taking the road less travelled can be managed.

More Keys to Successful Deployment

- **Demonstrations during the investment-grade audit can help reduce risks**
- **Use technology experts from the national labs and private sector to educate stakeholders**
- **Financial incentives can help offset first costs**
 - e.g., many utilities offer “custom” programs that permit incentives for non-standard technologies

D-22

22 | Federal Energy Management Program eere.energy.gov

Several agencies have reduced the uncertainty about non-standard ECMs well before the ESPC task order is awarded by running a demonstration of the technology during the investment-grade audit.

Few of these technologies are available as one-size-fits-all applications. The technology experts from the national labs can help by answering technical questions and educating stakeholders on the ECMs’ risks and benefits.

Agencies should be aware that many of these technologies may qualify for “custom” incentives from utilities and public benefit programs.

Incorporating Renewable Energy

D-23

Renewable Energy (RE) Screenings

- **Screenings offered by FEMP: First-come, first-served (and depending on available funds)**
- **NREL completes high-level screening and report evaluating site’s potential resources for RE:**
 - Daylighting
 - Wind
 - Biomass/Alt. methane fuels
 - Geothermal heat pumps
 - Solar – PV, solar thermal, solar water heating, solar vent preheat



D-24

24 | Federal Energy Management Program eere.energy.gov

As of FY2013, agencies are required to have 7.5% of their electricity generated by renewable sources.

FEMP also provides assistance to agencies to help them implement renewable energy ECMs as part of their ESPC projects, notably Renewable Energy Screenings.

Experts on the FEMP team from the National Renewable Energy Laboratory (NREL) can complete a high-level screening based on information provided by the agency. NREL then produces a report evaluating the site’s potential for renewable ECMs.

Obtaining a Renewable Energy Screening

- As part of acquisition planning, agency enters site data on FEMP-provided form
- Agency submits completed form to NREL
- NREL completes the screening and returns the report in about four weeks

D-25

25 | Federal Energy Management Program eere.energy.gov

Screening Shows Potential Cost Savings and Simple Payback for Renewable Technologies

Technology	System Size	Units	Initial Cost	Annual Cost Savings	Annual Operating Cost	Simple Payback (years)
Photovoltaics	500	nameplate capacity (kW)	\$2,761,250	\$63,112	\$3,616	46.4
Solar Vent Preheat	5,000	area (sq feet)	\$184,337	\$19,762	\$0	9.3
Solar Water Heating	10,000	panel area (sq feet)	\$979,227	\$67,030	\$4,896	15.8
Daylighting	3.5%	skylight/floor area ratio (%)	\$531,494	\$18,379	\$0	28.9
Solar Thermal	10,000	collector area (sq feet)	\$819,060	\$48,050	\$1,939	17.8
Wind Power	500	capacity (kW)	\$1,532,592	\$44,620	\$3,950	37.7

D-26

26 | Federal Energy Management Program eere.energy.gov

This example of a renewable energy screening shows that the best potential for RE at this site is in solar vent preheating, solar water heating, and solar thermal.

In order for an ECM to cash flow on its own (generate sufficient savings to exceed payments during the project term) in less than 25 years, it will probably need to have a simple payback of around 15 years. Technologies with longer simple paybacks can be included in ESPCs, but their longer paybacks will need to be offset by shorter-payback ECMs to make the project cash flow within a 25-year contract term.

Example Screening Report – Analysis provides detailed results for each technology

PV rating (kW)	500
PV Size (ft ²)	32,024
PV Initial Cost (\$)	2,805,000
PV Rebate (\$)	43,750
PV Production Incentive (\$/year)	0
PV State Tax Credit (\$)	0
PV Federal Tax Credit (\$)	0
PV Initial Cost w/incentives (\$)	2,761,250
Net Metering up to (kW)	0
PV Annual Energy Delivery (kWh/year)	602,712
Capacity Factor (%)	17.9%
PV Annual Utility Cost Savings (\$)	63,112
PV Annual O&M Cost (\$/year)	3,616
PV Payback Period (years)	46.4

D-27

27 | Federal Energy Management Program eere.energy.gov

The analysis done by the NREL team provides detailed results for each technology analyzed. This kind of data can help make it more feasible for the ESCO and agency to consider renewables for the project.

Power Purchase Agreements (PPAs)

- **PPAs allow agencies to fund on-site RE projects with no up-front capital costs**
 - Developer installs and owns system on agency property, taking tax benefits
 - Agency purchases the generated power, paying for the system over the life of the contract
- **A PPA may be included as an ECM in an ESPC project**
 - Check with FEMP, an FFS, or your PF about current rules and whether a PPA is an option at your site

D-28

28 | Federal Energy Management Program eere.energy.gov

For more information on PPAs and purchasing green power, Navigate from FEMP’s home page: → *Technologies* → *Renewable Energy* → *Purchasing Renewable Power*

Summary: Great Reasons to Consider Advanced EE and RE Technology for Your ESPC

- **Requirements for energy-efficient product procurement**
- **ESPCs are a proven vehicle for deployment of advanced EE and RE**
 - Risk management
 - ESCOs invested in project success
- **FEMP provides support every step of the way**

Agency Motivation Makes it Happen!

D-29

29 | Federal Energy Management Program eere.energy.gov

ESPCs are a proven vehicle for cost-effective procurement and deployment of energy-efficient products, new, emerging, and advanced energy-saving technology, and on-site renewable energy generation. In addition to their savings and performance guarantees, the DOE IDIQ ESPCs have the advantage of allowing agencies to customize their task orders within the terms of the contract to manage and allocate risks associated with non-standard technologies (e.g., through specifics of the M&V plan and allocation of responsibilities for operations and maintenance and repair and replacement). The freedom to bundle technologies with longer payback periods with short-payback ECMs in ESPCs also opens the door to developing comprehensive energy-saving projects and achieving maximum energy savings at the site.

The ESCOs are good partners for installing new and emerging technologies because they are invested in the success of your ESPC project and they welcome opportunities to gain experience with promising emerging and under-utilized technologies.

FEMP’s assistance can help agencies and ESCOs locate the best available information on new technologies to help them cooperatively manage risk.

FEMP Assistance and Resources

- **FEMP Web site**
www1.eere.energy.gov/femp
- **FEMP → Technologies →**
 - → Energy-Efficient Products
 - → Technology Deployment
 - → Renewable Energy
- **FFS, PF, national lab technology experts**

D-30

30 | Federal Energy Management Program eere.energy.gov

The *Technologies* section of FEMP’s Web site includes access to training on subjects related to buying energy-efficient products, case studies, data, and many other resources.

FEMP’s FFS’s, PFs, and the national lab experts on FEMP’s team bring their experience, best practices, and lessons learned from hundreds of past projects to help agencies with every step of the way.



Exercise 1

Acquisition Planning

D-31

31 | Federal Energy Management Program eere.energy.gov



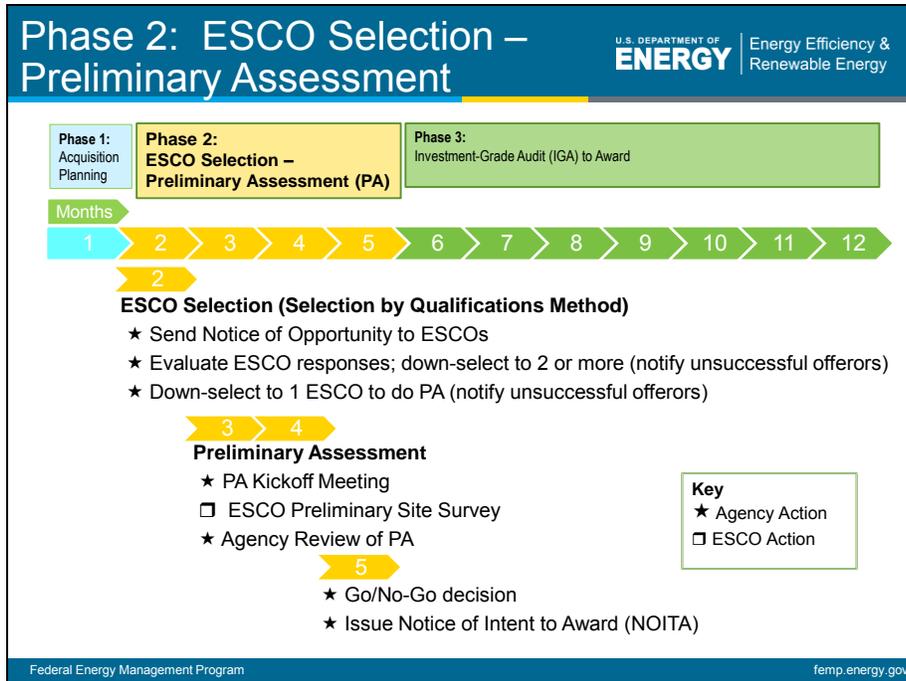
Next Learning Module: E

Phase 2 – ESCO Selection and Preliminary Assessment

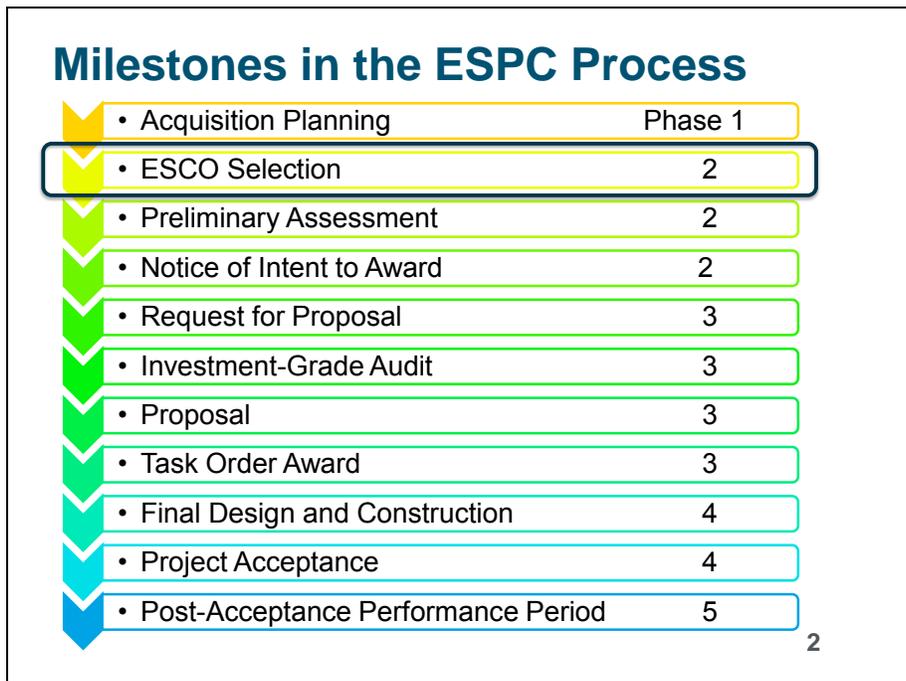
D-32

32 | Federal Energy Management Program eere.energy.gov

E – Phase 2, ESCO Selection and Preliminary Assessment



This module addresses the process of getting through ESCO selection and issuing the Notice of Intent to Award.



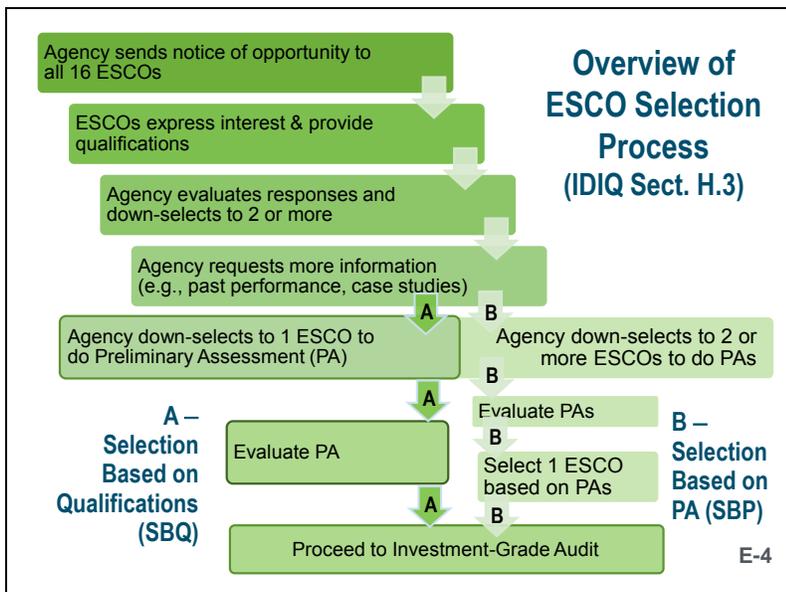
U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

**Good News:
Defense Authorization Act of 2011
(Sec. 828) makes ESCO selection easier**

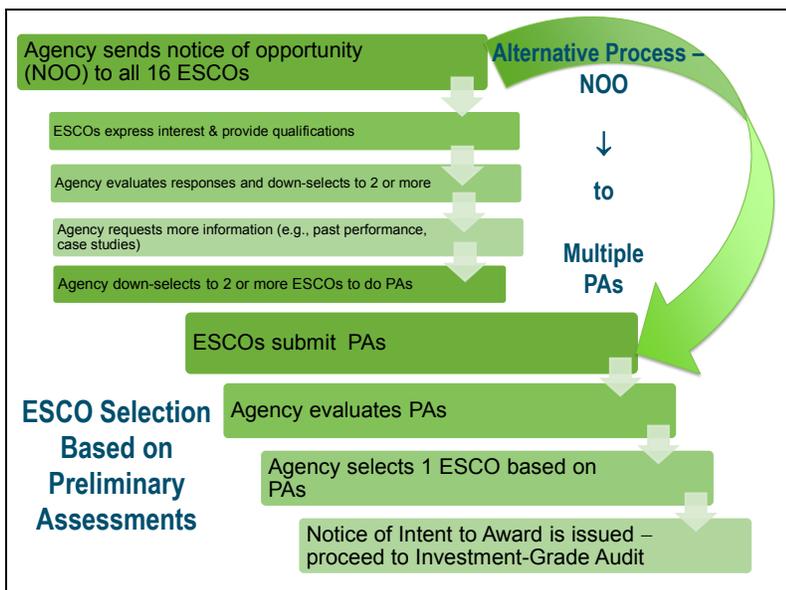
- Agency may down-select to 1 ESCO to perform Preliminary Assessment
- The DOE ESPC IDIQ has been modified to incorporate this change (see copy of IDIQ section H.3 in handbook)
- All DOE-FEMP ESPC ESCOs went through full and open CICA competition before IDIQ award

E-3

Federal Energy Management Program femp.energy.gov



This slide charts the ESCO selection process as defined in NDAA and the ESPC IDIQ. Under this process agencies may down-select to one or more than one ESCO to submit a PA. However, our discussion will mostly assume that agencies will select one ESCO and receive one PA.



Agencies may also choose to base their selection of ESCO on evaluation of multiple preliminary assessments from ESCOs.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

ESCO Selection Step 1: Notice of Opportunity (NOO)

- Tailor for project – ask for information:
 - truly helpful in selecting best-suited ESCO for your project
 - to show whether ESCO's qualifications fit agency's needs
- Keep short to avoid wasted expense and effort —
 - This is a qualifications-based selection from a fully competed list of IDIQ holders
- **Experienced FFS, PF, and FEMP team will help with**
 - preparing NOO etc.; contracting support; PA review

E-6

Federal Energy Management Program femp.energy.gov

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Evaluating ESCOs' Qualifications and Past Performance

- Review ESCOs' qualification statements: (FEMP-ESPCs-ESCOs)
- Check past performance
 - Ask for contact info for ESCOs' five last projects (or projects in last 3 – 5 years)
 - Check Government-wide Past Performance Information Retrieval System (PPIRS)
- Before making selection, check *SAM for CCR, ORCA, and EPLS (see notes)

E-7

Federal Energy Management Program femp.energy.gov

*SAM = System for Award Management
 CCR = Central Contractor Registration
 ORCA = Online Representations and Certifications Application
 EPLS = Excluded Parties List System

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Select ESCOs for Further Consideration (if down-selecting before PAs)

- Evaluate responses to NOO
- Select only those worthy of further evaluation
- Issue notice to unsuccessful offerors
- Notify those selected — inform of next down-select process

E-8

Federal Energy Management Program femp.energy.gov

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Select One ESCO to Do Preliminary Assessment (PA) (SBQ Method)

- Hold written or oral discussions with two or more ESCOs selected based on NOO response
- Select ESCO to do PA
 - Agency selection approval process
- Notify unsuccessful offerors
- Notify successful ESCO
- Notify FFS and PF
- Schedule PA kickoff meeting

E-9

Federal Energy Management Program femp.energy.gov

Milestones in the ESPC Process

• Acquisition Planning	Phase 1
• ESCO Selection	2
• Preliminary Assessment	2
• Notice of Intent to Award	2
• Request for Proposal	3
• Investment-Grade Audit	3
• Proposal	3
• Task Order Award	3
• Final Design and Construction	4
• Project Acceptance	4
• Post-Acceptance Performance Period	5

10

ESCO’s Preliminary Assessment

The Preliminary Assessment (PA) is intended to give the agency enough information to make a confident decision on proceeding with the project, but is not expected to reflect a complete understanding of agency- and site-specific requirements. The PA is intended to be produced at modest cost to the ESCO. The preliminary assessment must comply with the IDIQ contract.

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

PA Kickoff Meeting

- Review roles and responsibilities
- Establish communication protocols
- Schedule and arrange for site visit for audit
- Review requirements/expectations for PA
- Set schedule for submission and review of PA



See sample agenda for kickoff meeting

E-11
Federal Energy Management Program | femp.energy.gov

The PA includes

- a narrative summary of the proposed project,
- management approach,
- descriptions of the ECMs,
- M&V overview,
- risk, responsibility, and performance matrix,
- estimates of proposed energy and cost savings, and
- estimated price in the financial schedules.

ESCO Develops Preliminary Assessment at Own Risk.

The government is not liable for the ESCO’s costs for development the PA unless a task order based on the preliminary assessment is issued to the ESCO. If no task order is awarded, the government has no rights to the contractor’s proprietary work products, such as surveys, data, feasibility study reports, and design documentation.

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Purpose of the PA

- The PA is a high-level description of a feasible project based on ESCO’s walk-through audit and any information provided by agency
- Expected to give agency enough information to make a confident decision about proceeding with project
- Intended to be produced at modest cost to ESCO
- Not expected to reflect a complete understanding of site/agency-specific requirements; not expected to be perfect

E-12
Federal Energy Management Program | femp.energy.gov

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

Key Elements of the PA

- Must comply with IDIQ contract requirements (section H.4), however:
- IDIQ gives agency CO broad discretion to define requirements
- Key elements
 - A narrative summary of proposed project
 - Description of ECMs
 - Estimates of proposed energy and cost savings
 - M&V approach (general)
 - Financial schedules
 - Management Plan
 - Risk, Responsibility, and Performance Matrix

E-13

Federal Energy Management Program | femp.energy.gov

Review of PA

The agency's decision on whether or not to proceed with the project is based on its evaluation of whether the project outlined in the preliminary assessment appears to be feasible and whether it addresses the agency's needs and priorities as conveyed to the ESCO by the agency.

The project described in the preliminary assessment won't be perfect, but it should include all the top priority ECMs expected in the final package. Does it meet or can it be adjusted to meet the majority of your site's needs? And overall, do you think your agency and the ESCO can have a good long-term relationship?

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

PA Review – General Issues

- Does this meet (or can it be adjusted to meet) the majority of our needs?
- Does the PA show the ESCO listened and tried to meet our goals and needs?
- Is the proposed scope sufficiently comprehensive?
- Can our agency and the ESCO have a good long-term partnership?

E-14

Federal Energy Management Program | femp.energy.gov

PA Review Guidance

Guidance on reviewing PAs is provided on FEMP's ESPC Resources Web page. Some of the criteria to consider are the following:

- Are ECM descriptions and projected energy savings reasonable, acceptable and comprehensive?
- Is M&V approach reasonable and appropriate?
- Is estimated annual cost savings reasonable and consistent with technical approach?
- Are service phase line items, contract term and total cost reasonable and consistent with technical approach?

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

PA Review – Specific Issues

- Are ECM descriptions and projected energy savings reasonable?
- Is M&V approach appropriate?
- Are contract term and total cost acceptable?
- Are all agreed on ECMs to be explored in investment-grade audit?

E-15

Federal Energy Management Program | femp.energy.gov

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Review ESCO's Project Management Approach

- ESCO's organizational structure
- Project management organization, approach, and project timeline
 - Is a full-time ESCO project manager assigned?
- Proposed O&M services
- Proposed repair and replacement services

E-16

Federal Energy Management Program | femp.energy.gov

Management Approach

The management approach consists of the ESCO's organizational structure for the project, the Risk, Responsibility, and Performance Matrix, the proposed O&M and R&R services, and a project timeline. In addition, the ESCO will furnish a Small Business Subcontracting Plan to outline their practices in hiring subcontractors.

Consider the following review criteria:

- Project management approach and timeline are well suited for successful project implementation.
- Operations and maintenance plan addresses site requirements.
- Repair and replacement responsibilities address site requirements.

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Evaluating the ESCOs' Technical Approach

- Things to consider:
 - Comprehensiveness/depth of proposed scope
 - Responsiveness to your desired ECMs and approach
 - ESCO's assumptions and exceptions
 - Changes to facility operations as result of installed ECMs
- Note: If selecting based on PA, inviting ESCOs to make presentations may help in selecting among finalists
- If selecting based on qualifications, doing interviews with each ESCO would be helpful.

E-17

Federal Energy Management Program | femp.energy.gov

The PA won't be perfect, but it should include all the top-priority ECMs expected in the final package. Any agency or FEMP comments on the preliminary assessment should be recorded, consolidated, and provided to the ESCO. These comments should be resolved in the investment-grade audit (IGA) and proposal, without requiring additional iterations of the preliminary assessment.

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Key Components of the Price Estimate

- Project development costs
- Costs for each ECM, including replacement parts and repairs
- Indirect costs and profit
- Financing costs
- Costs of performance period services

- [More to come on pricing and Task Order (TO) Financial Schedules]

E-18

Federal Energy Management Program | femp.energy.gov

The Go/No-Go Decision

GO Accept [one] PA
Provide feedback on deficiencies and desired changes to address in proposal

No Go Return and reject PA(s) if not satisfactory
Scrap the project, or consider starting over (sending new NOO to all ESCOs)

(All rejected PAs must be dealt with as specified in the solicitation.)

E-19
Federal Energy Management Program | femp.energy.gov

This slide assumes that you’re making your selection based on qualifications, and you’re only reviewing one preliminary assessment.

After the PA is reviewed is a decision point: Will you go forward with the project based on this preliminary assessment or not? If the site decides to go forward, the CO/COTR should provide comments to the ESCO about the PA, and particularly any adjustments needed in the ESCO’s approach or direction as the ESCO team conducts the investment-grade audit.

If the agency rejects the preliminary assessment it must be treated in accordance with the solicitation. Typically it must be treated as proprietary information, and the agency may not use it in developing future projects. At that point you can walk away from the project or you can consider starting anew and writing up a new set of requirements. This is very rare but it has occurred.

Note on Selection Based on Preliminary Assessment Process:

In the case where the agency is making its selection of an ESCO based on *Selection Based on Preliminary Assessment* method, with PAs submitted by more than ESCO (rather than the *Selection Based on Qualifications* method), a few additional considerations apply. If the agency feels that none of the preliminary assessments is satisfactory, it will reject and return all copies of the PAs to the ESCOs. The agency may start over by issuing a revised set of requirements in a new Notice of Opportunity to the DOE IDIQ ESCOs, but may not disclose the original ESCO’s proprietary information.

Until an agency commits to go forward with a TO there is no cost risk to the government.

Milestones in the ESPC Process

• Acquisition Planning	Phase 1
• ESCO Selection	2
• Preliminary Assessment	2
• Notice of Intent to Award	2
• Request for Proposal	3
• Investment-Grade Audit	3
• Proposal	3
• Task Order Award	3
• Final Design and Construction	4
• Project Acceptance	4
• Post-Acceptance Performance Period	5

20

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

The Notice of Intent to Award (NOI)

- Formalizes decision to proceed
- Specifies timeframe for completion of investment-grade audit (IGA) and proposal
- Outlines any pre-award requirements (such as proof of insurance)
- May be issued concurrently with TO-RFP

E-21

Federal Energy Management Program | femp.energy.gov

Notice of Intent to Award

The agency contracting officer formalizes the decision to proceed and conditionally commits to awarding a project to the ESCO by transmitting a Notice of Intent to Award (NOI). The notice specifies a time frame and any conditions incumbent on the selected ESCO for conducting the investment-grade audit and submitting a proposal.

The government is not liable for costs associated with audits and preparation of PAs unless a task order is awarded for the project addressed by the PA. Once the notice of intent to award is issued, however, the ESCO may expect to recover project development costs as part of the negotiated TO price.

The two-step DOE IDIQ ESPC process calling for a PA followed by a proposal based on the investment-grade audit was established in the IDIQ contracts in accordance with the legislated ESPC authority, based on consensus among federal policy makers and the ESCO community on how to best conserve time and money for both parties. At the point of issuing an NOI, the agency has already enjoyed a no-risk assessment of their desired project, and the process requires that a decision be made so that the ESCO will not continue to invest even greater resources at continued risk. The law and contract process recognize that the ESCOs could not operate, and there would be no program, if ESCOs' project development investments were at risk until award. Therefore, it is important that the agency be certain of its commitment before issuing the NOI, and that the notice contain any conditions deemed necessary by the agency.

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Prior to Issuing Notice of Intent to Award...

- Confirm intent to proceed with all site and other affected personnel
- Verify IDIQ ordering capacity with DOE Golden Office
 - Likely not an issue – each ESCO has \$5B contract ceiling – but need to check

E-22

Federal Energy Management Program | femp.energy.gov

U.S. DEPARTMENT OF **ENERGY** | Energy Efficiency & Renewable Energy



Exercise 2 –
ESCO
Selection

E-25

Federal Energy Management Program femp.energy.gov

U.S. DEPARTMENT OF **ENERGY** | Energy Efficiency & Renewable Energy



Exercise 3 –
PA Review

E-26

Federal Energy Management Program femp.energy.gov

U.S. DEPARTMENT OF **ENERGY** | Energy Efficiency & Renewable Energy



Next: F
Introduction to M&V

E-27

Federal Energy Management Program femp.energy.gov

F – Introduction to M&V

Introduction to Measurement & Verification in Federal ESPCs

What you don't measure, you can't manage.

F-1

Some people think that M&V is just for technical staff, but it is central to the enforcement of the savings guarantees in ESPCs, so a basic level of understanding is important for anyone engaged with a project. This module aims to provide those basics, and in a way that is accessible to technical and non-technical personnel alike.

M&V is a factor throughout the ESPC process

• Acquisition Planning	Phase 1
• ESCO Selection	2
• Preliminary Assessment	2
• Notice of Intent to Award	2
• Request for Proposal	3
• Investment-Grade Audit	3
• Proposal	3
• Task Order Award	3
• Final Design and Construction	4
• Project Acceptance	4
• Post-Acceptance Performance Period	5

2

U.S. DEPARTMENT OF **ENERGY** | Energy Efficiency & Renewable Energy

What is M&V, and why do you need it?

- **M&V refers to any activities aimed at determining whether the savings guarantee is being met**
 - The guarantee and annual M&V are legally and contractually required
- **When M&V is done well, it will:**
 - Reduce uncertainty of the savings estimates to a reasonable level
 - Allocate risks appropriately
 - Potentially identify operations & maintenance issues

F-3

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Basic M&V Concepts

- M&V methods should balance savings assurance against added cost
- The degree of M&V should be proportional to
 - 1) the ECM's savings; and
 - 2) the ECM's performance risk
- Good M&V plans require ESCOs to measure the key performance parameters of ECMs
- If the M&V plan is weak, the guarantee may be met only on paper

F-4

M&V activities represent a parasitic cost to an ESPC project – but one that is warranted. The challenge is getting the balance right between added M&V and added savings certainty.

Complex, interactive ECMs generally justify greater M&V effort (and cost).

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

FEMP Guidance on M&V

(items 2, 6, 8, and 9 in the “Resources” section of FEMP’s ESPC Web site)

- FEMP M&V Guidelines v. 3.0
 - M&V specifically for federal energy projects
 - Application of the International Performance Measurement and Verification Protocol (IPMVP)
- Introduction to M&V for FEMP ESPC Projects
- Guidance on government witnessing of M&V
- Guidance on reviewing M&V reports

F-5

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

M&V in the ESPC Process

(more on this in Phases 4 & 5)

Baselines	• Defined in IGA and Proposal
M&V Plan	• Developed as part of Proposal
Post-Installation M&V Report	• Verification of ECMs’ ability to perform
Annual M&V	• Activities per M&V Plan • Findings documented in M&V reports

6

The DOE-FEMP ESPC IDIQ contract prescribes the M&V process in general, and specifics are defined in each task order.

ESCOs are required to use templates for the M&V plan, post-Installation reports, and the periodic (at least annual) M&V reports required during the post-acceptance performance period. These templates are attachments to the DOE-FEMP ESPC contract and are available on the ESPC Resources page of FEMP’s Web site.

Developing the M&V Plan

The M&V plan is the single most important item in an energy savings “guarantee.” Although the M&V plan is usually developed during contract negotiations, it is important that the agency and the ESCO agree upon general M&V approaches to be used prior to starting the IGA. The M&V method(s) chosen can have a dramatic affect on how the baseline is defined, determining what activities are conducted during the audit.

The project-specific M&V plan includes project-wide items as well as details for each ECM, including:

- Details of baseline conditions and data collected
- Documentation of all assumptions and sources of data
- What will be verified
- Who will conduct the M&V activities
- Schedule for all M&V activities
- Details of engineering analysis performed
- How energy savings will be calculated
- Utility rates and how they will be used to calculate cost savings
- Details of O&M cost savings claimed
- Defined O&M reporting responsibilities
- Defined content and format of all M&V reports
- How and why the baseline may be adjusted

Post-Installation Verification

Post-installation verification is conducted by both the ESCO and the federal agency to ensure that proper equipment/systems were installed, are operating correctly, and have the potential to generate the predicted savings. The verification is accomplished through commissioning and M&V activities.

Commissioning of installed equipment and systems is required. Commissioning ensures that the building systems perform according to the design intent. Commissioning is generally completed by the ESCO and witnessed by the agency. In some cases, however, it is contracted out to a third party.

Post-installation M&V activities specified in the M&V plan may include surveys, inspections, spot measurements, and short-term metering. The results of the M&V activities are presented in a *Post-Installation M&V Report* delivered by the ESCO prior to final project acceptance.

Regular-Interval Verification During the Performance Period

At least annually, the ESCO and the federal agency verify that the installed equipment/systems have been properly maintained, continue to operate correctly, and continue to have the potential to generate the predicted savings. Although an *Annual M&V Report* from the ESCO is required to substantiate savings guarantees, more frequent verification activities can be appropriate. This ensures that the M&V monitoring and reporting systems are working properly, it allows fine-tuning of measures throughout the year based on operational feedback, and it avoids surprises at the end of the year.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Baselines

- Typically proposed for each ECM by ESCO as part of investment-grade audit; agency reviews/approves
- Baselines are compared to post-installation energy use to determine savings
- Once project is installed, it's difficult or impossible to revisit baselines, so properly defining them is important
- Baselines may vary with changes in weather (or other factors, potentially)
 - e.g., gas usage = 2500 MMBtu + 46 × (Heating Degree Days)

F-7

Defining the Baselines

Typically the ESCO defines the baselines as part of the investment grade audit (IGA). Baseline physical conditions (such as equipment inventory and conditions, occupancy, nameplate data, energy consumption rate, control strategies, and so on) are typically determined during the IGA through surveys, inspections, spot measurements, and short-term metering activities. Baseline conditions are established for the purpose of calculating savings by comparing the baseline energy use to the post-installation energy use. Baseline data are also used to account for any changes that may occur during the performance period, which may require baseline adjustments. The baseline data is included in the ESCO's proposal. It is the agency's responsibility to ensure that the baseline has been properly defined.

In almost all cases, after the ECM has been installed, it is impossible to re-create the baseline. Therefore, it is very important to properly define and document the baseline conditions. Deciding what needs to be monitored, and for how long, depends on factors such as the complexity of the measure and the stability of the baseline, including the variability of equipment loads and operating hours, as well as other variables that affect the load.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Savings Guarantee

- Savings must exceed payments
 - This is cardinal rule of federal ESPC
 - DOE has interpreted this to mean that savings must exceed payments in each year
- Savings that may be used to pay the ESCO:
 - Energy and water cost savings
 - Energy/water-related cost savings

F-8

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

Energy and Water Cost Savings

- Reductions in system use
- Efficiency improvements
- Reductions in peak demand
- Reductions in energy rates
- Shifting time of use to lower-cost periods
- Switching to less expensive fuels
- Self-generation (including cogeneration/CHP)
- Reduced water and sewer use
- Reduced sewer charges (e.g., due to irrigation)

F-9

Energy and water cost savings can result from reduced equipment usage or from improved efficiency. Utility costs can be decreased because of reduced peak demand, fuel substitution, renegotiated utility rates, etc.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

Energy/Water-Related Cost Savings

- Most commonly reduced O&M expenses
 - Parts and repair costs
 - Equipment replacement costs
 - O&M contracts and other labor
- Cost savings must be real
 - If labor savings are claimed, agency must demonstrate contract or staff reductions
 - Reducing tasks of existing staff does not count

F-10

Energy/water-related cost savings are from reduced expenses for operations and maintenance (O&M) or repair and replacement (R&R) of energy-consuming systems. These are often recurring, annual savings, as opposed to one-time savings.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

Other Sources of Savings (and thus payments)

- Cost avoidance provided by the project
 - Example: Including chiller replacement funds in project where funds were planned to be paid out of repair & replacement budget in early year of project
- Construction period energy savings
 - Savings accrued from ECMs that are installed and performing in advance of project acceptance
- More info on acceptable sources of savings:
 - Practical Guide to Savings and Payments in Federal ESPC Projects, in “Resources” section of ESPC Web site

F-11

One-time savings that are the result of the ESPC project can be used to pay off the deal, usually as a pre-performance-period payment. For example, the agency may have been planning to replace a chiller using O&M/R&R funds, and then decide to include the chiller replacement in the ESPC project. The money that would have been used to replace the chiller in the absence of the ESPC project can be used to help pay for the ESPC project. Recurring, ongoing savings resulting from reduced O&M/R&R expenses may also be used to pay for the ESPC. To learn more about the financial structure of ESPCs, see the *Practical Guide to Savings and Payments in Super ESPC Delivery Orders*.

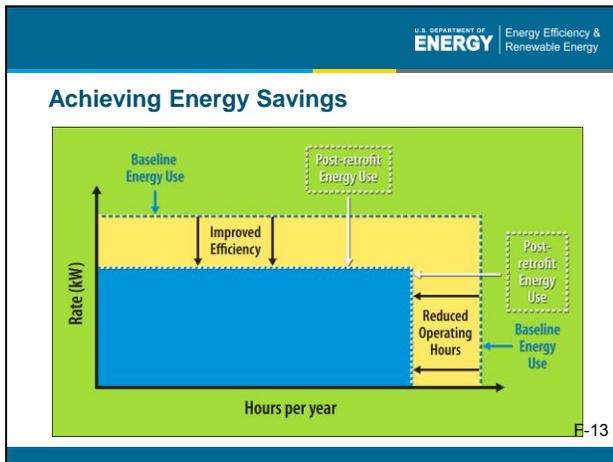
U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Calculating Savings

- There are two components to energy use
 - Rate of energy use (e.g., watts of lamp)
 - Usage (hours of use)
- Energy use is the product of the two
 - Example: 4 kW × 2 hours = 8 kWh
- Reducing the rate of energy use or the usage (hours) reduces the total energy use

F-12

There are two fundamental factors that drive energy savings: performance and usage. Performance describes how much or how little energy is used to accomplish a specific task; usage describes how much of the task is required, such as the operating hours that a piece of equipment runs. Lighting provides a simple example: performance would be the watts required to provide a specific amount of light; usage would be the operating hours per year. A chiller is a more complex system: performance is defined as kW/ton, which varies with load; usage is defined by cooling load profile and ton-hours. In all cases, both performance and usage factors need to be known to determine savings.



U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

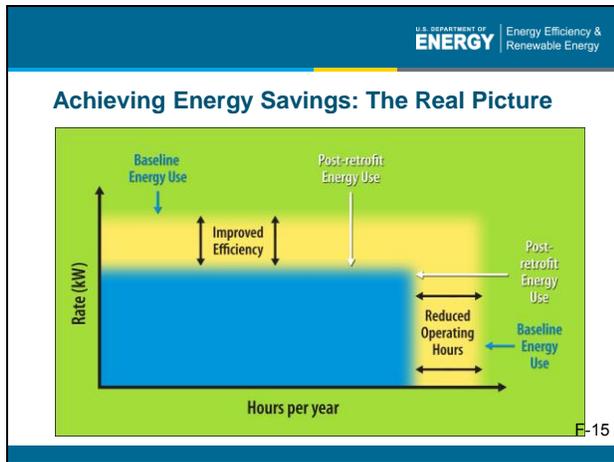
Savings Uncertainty

- We can't measure savings directly
 - Because it's the absence of something – i.e., it's energy use that's not there any more!
- We measure energy use before and after the ECM – the savings is the difference (roughly)
- We usually don't know the exact energy use before and after
 - there is almost always some uncertainty in each
- And even when we do, we can't know for sure what's responsible for all the change

F-14

Uncertainty in ESPC is simply the inability to exactly and consistently quantify the savings. Unlike energy, energy *savings* cannot be directly measured. Instead, savings are estimated by comparing the way a system operated before and the way it operated after a measure was installed.

Even though a large number of parameters can be measured, there are still errors associated with measuring equipment. Since not every piece of equipment can be measured, sampling techniques are often used which can introduce additional uncertainty. Random variations occur in building energy use or equipment that may be related to human behavior, weather conditions, or other factors. Simplifying assumptions are sometimes used

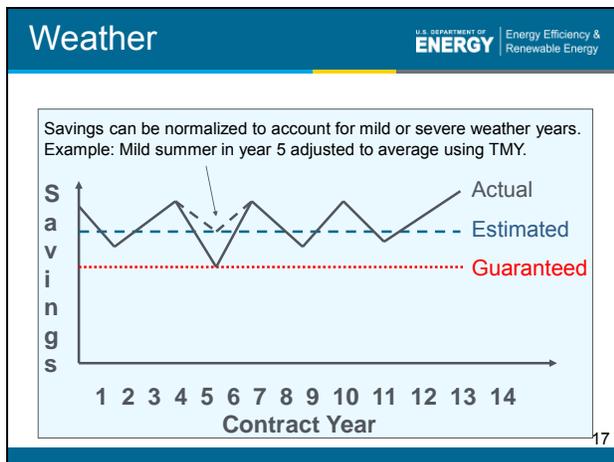


when it is too difficult to measure or estimate a parameter, introducing additional uncertainty.

All of these factors prevent us from obtaining a totally accurate measure of savings. In M&V, the goal is to minimize these uncertainties to acceptable levels, understanding that they can never be completely eliminated.

The blurriness in the lines of these boxes represent the uncertainty due to all the imperfectly controlled variables affecting savings.

- Uncertainty can be reduced, but never eliminated**
- Claimed savings are always estimates because savings cannot be measured directly
 - Uncertainty is introduced through:
 - Measurement and modeling error
 - Sampling error
 - Simplifying assumptions
 - Other changes at facility
 - These factors are inherent in M&V



Using M&V to Manage Risk

“Risk” in the M&V context refers to the uncertainty that expected savings will be realized. Assumption of risk implies acceptance of the potential monetary consequences. Both ESCOs and agencies are reluctant to assume responsibility for factors they cannot control, and holding certain parameters fixed in the M&V plan can match up responsibilities. For example, usage factors under the agency’s control such as lighting operating hours and thermostat setpoints, are typically held constant for the purposes of the contract. Using “stipulations” like this means that the ESCO and agency agree to use a set value for a parameter throughout the term of the contract, regardless of the actual behavior of that parameter.

If no values are fixed and savings are verified based entirely on measurements, then all risk resides with the ESCO, who must show that the guaranteed savings are realized, regardless of contributing factors. Alternatively, the agency assumes the risk for the parameters that are held constant. In the event that the fixed values over- or under-state the savings, the agency must still pay the ESCO according to the agreed-upon values. If the actual savings are greater than expected, the agency retains all of the surplus savings.

Risk related to usage stems from uncertainty in operational factors. For example, savings fluctuate depending on weather, how many hours equipment is used, user intervention, and maintenance practices. Since ESCOs often have no control over such factors, they are usually reluctant to assume usage risk. The agency generally assumes responsibility for usage risk by either allowing baseline adjustments based on measurements, or by agreeing to fixed equipment operating hours and other usage-related factors.

In the example in the slide, some of the lower actual savings in year 5 could be due to mild weather conditions. If so, an adjusted baseline may indicate that the savings were still met.

Performance risk is the uncertainty associated with equipment performance. The ESCO is ultimately responsible for selection, application, design, installation, and performance of the equipment and typically assumes responsibility for achieving savings related to equipment performance. To validate performance, the ESCO must demonstrate that the equipment is operating as intended and has the potential to deliver the guaranteed savings.

Fixing parameters in savings estimates can be a practical, cost-effective way to minimize M&V costs and allocate risks. These stipulations, used appropriately, do not jeopardize the savings guarantee, the agency's ability to pay for the project, or the value of the project to the government. However, holding variables constant through the term of an ESPC serves to shift risk to the agency, and the agency should understand the potential consequences before accepting them. Risk is minimized and optimally allocated through carefully crafted M&V requirements including diligent estimation of the fixed values.

Detailed discussion of the appropriate use of stipulations is included in the *FEMP M&V Guidelines*.

M&V Options: A, B, C, and D

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

- Options address risk allocation
- Each ECM assigned an M&V option
- Measurements differ by:
 - Level – individual system vs. whole building
 - Duration – spot, short-term, periodic, continual
 - Whether key values are held constant without performance period measurement
 - Example: Hours of lighting operation may be determined in IGA and then fixed for purposes of savings calculation
 - Expense
 - Up-front – ranges from 1 to 15% (avg. 3%) of project investment
 - Annual – averages about 3% of annual savings
 - More complex, interactive ECMs justify more M&V effort

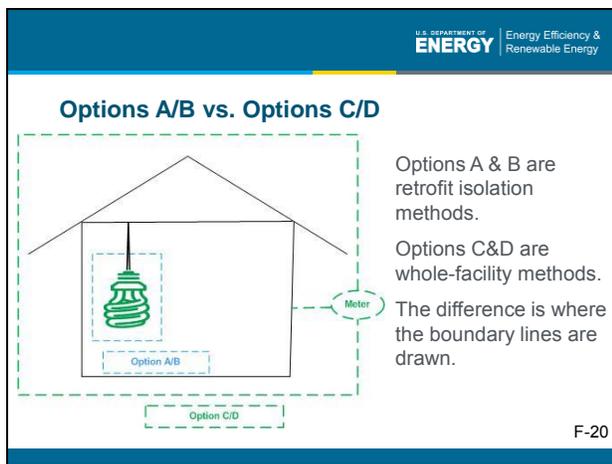
F-18

M&V Options A, B, C, and D

The FEMP M&V guidelines and IPMVP group M&V methodologies into four categories: Options A, B, C, and D. The options are generic M&V approaches for energy and water saving projects. Options A, B, C, and D are consistent with those defined in the IPMVP. Having four options provides a range of approaches to determine energy savings depending on the characteristics of the ECMs being implemented and balancing increased certainty in energy savings estimates with the cost of conducting M&V.

FEMP and IPMVP M&V Options	
M&V Option	How savings are calculated
Option A: "Retrofit Isolation, Key Parameter" – Based on measurement of <i>key</i> parameter, either equipment performance or operational factors (usually equipment performance)	Engineering calculations using measured and estimated data
Option B: "Retrofit Isolation, All Parameters" – Based on measurements (usually periodic or continuous) taken of <i>all</i> relevant parameters; often entails long-term metering.	Engineering calculations using measured data
Option C: Based on <i>whole-building</i> or facility-level utility meter data adjusted for weather and/or other factors.	Analysis of utility meter data
Option D: Based on <i>computer simulation</i> of building or process; simulation is calibrated with measured data.	Comparing different models

F-19



Options A, B, C, and D

M&V approaches are divided into two general types: retrofit isolation and whole facility. Retrofit isolation methods look only at the affected equipment or system independent of the rest of the facility; whole-facility methods consider the total energy use while ignoring specific equipment performance. Options A and B are retrofit isolation methods; Option C is a whole-facility method. Option D can be used as either, but is usually applied as a whole facility method.

Option A

Option A is a retrofit isolation approach designed for projects in which the potential to generate savings must be verified, and the actual savings can be determined from limited data collection, engineering calculations, and stipulated factors. Baseline and post-installation energy use is estimated using an engineering analysis of measurements of the most critical parameter.

The intent of Option A is to verify performance through pre- and post-retrofit measurements. Usage factors can be measured once (in the baseline period) or determined based upon engineering estimates, operating schedules, operator logs, typical weather data, or other documented information source. The selection of which factors to measure should be considered relative to the contractor’s responsibilities.

After post-retrofit measurements, annual inspections verify that the “potential to perform” exists. Measurements of the key parameter may or may not continue throughout the term of the contract. The level of accuracy of the calculated savings depends on the validity of the assumptions and what measurements are made.

Option B

Measurements of both performance and operational factors provide long-term persistence data on the energy use of the equipment or system. Measurements may be short-term, periodic, or continual.

Option B is a retrofit isolation or system level approach. Option B is similar to Option A but involves the measurement of all relevant parameters. This method is intended for retrofits with performance factors and operational factors that can be measured at the component or system level. Short-term periodic measurements can be used when variations in the measured factor are small, and may be sufficient to characterize the baseline. Continuous monitoring information can be used to improve or optimize the operation of the equipment over time, thereby improving the performance of the retrofit. This approach provides the greatest accuracy in the calculation of savings.

The intent of Option B is to verify performance periodically or continuously with long-term measurements.

Option C

Option C is a whole-building verification method. Savings are based on actual energy consumption as measured by the utility meter(s) , usually combined with simple regression modeling (to accommodate variables such as weather). Estimated savings will vary over the contract term.

Option C verification methods determine savings by studying overall energy use in a facility. The evaluation of whole-building or facility-level metered data is completed using techniques ranging from simple billing comparison to multivariate regression analysis. Generally, the overall level of savings must be more than 10-15% of total metered usage for this method to be effective. Analyses usually consider changes in weather, occupancy, load, and operations and adjust the baseline accordingly. Option C cannot verify the performance of individual measures but will verify the total performance of all measures, including interactions among them.

Option D

Option D is primarily a whole-building method but can be used at the component level. Savings are based on the results of a calibrated computer simulation model. Estimated savings may vary over the contract term if real weather data is used.

Option D uses calibrated computer simulation models of component or whole-building energy consumption to determine energy savings. Linking simulation inputs to baseline and post-installation conditions completes the calibration. Characterizing baseline and post-installation conditions may involve metering performance and operating factors before and after the retrofit. Long-term whole-building energy use data as well as periodic system level performance measurements may be used to calibrate the simulation(s). More elaborate models generally improve accuracy of savings calculations, but increase costs.

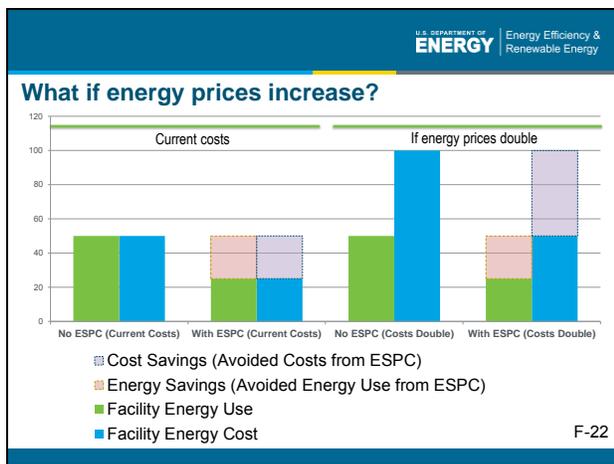
U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Energy Prices and ESPC

- When energy prices go up, savings appear to evaporate, because total utility costs go up
- What is the actual effect of per-unit energy price increases on ECMs' savings (cost avoidance)?
 - Yes, the bills may go up relative to prior levels, but ...
 - Key issue is what **they would be without** the ESPC
- ESPC can be seen as a hedge against higher energy prices

F-21

This topic is somewhat of a departure from previous information in this module, but is relevant to M&V because of the common confusion surrounding energy savings and energy costs.



This chart shows the value of an ESPC given changes in energy prices. This information can be useful for explaining to colleagues and decision makers how ESPCs saves energy and money whether utility costs increase or stay the same.

The first set of bars shows the situation where energy costs are equal to the energy amount consumed at current rates – a base case with no ESPC.

The second set of bars shows the effect of an ESPC on the energy use and how money that was previously wasted on energy is used to pay for the project investment.

The third set of bars shows what happens when energy costs double and no ESPC is in place. The cost to the agency for the same energy is doubled.

The last set of bars shows how an ESPC helps mitigate the effect on the agency when energy prices increase. The avoided cost to the agency goes up – in comparison to the third set of bars where no ESPC is in place – because of the rise in energy prices. So savings are greater, even though the energy bill received by the site is the same as it was just before the contract.

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Best M&V Practices During Project Development

- Understand ESCO's perspective
 - They're guaranteeing performance – is closer inspection (i.e., more M&V) in their interest?
- Recognize that goal is to reduce uncertainty in savings ... but that adding M&V adds cost
 - Need to balance these two
 - More complex ECMs usually merit more M&V

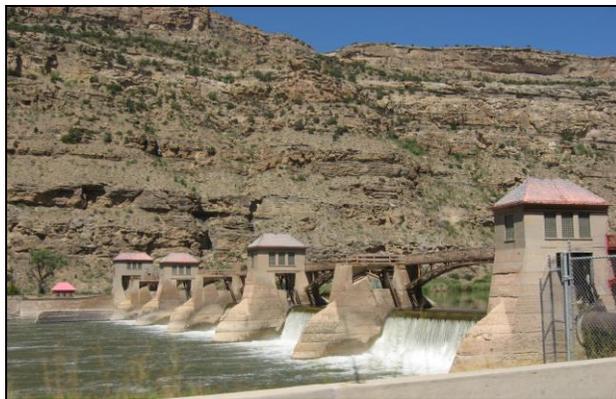
F-23

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Best M&V Practices During Project Development

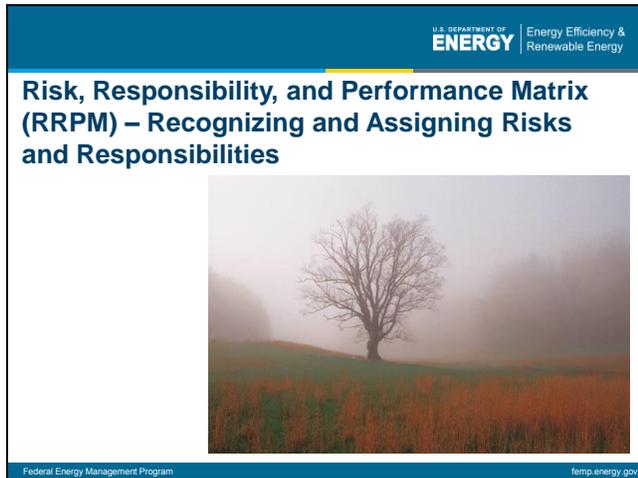
- Make sure that ESCO-proposed baselines and fixed parameters for ECMs are sound
 - Because they are cornerstones of the savings calculation
- Stay involved throughout performance period
 - Review annual M&V reports, stay in touch with ESCO, etc.
 - Take advantage of FEMP's life-of-contract support

F-24



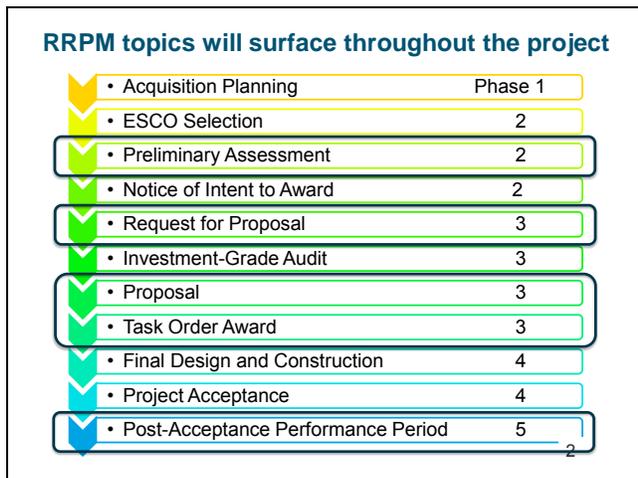
Next: [G – Risk, Responsibility, and Performance Matrix](#) F-27

G – Risk, Responsibility, and Performance Matrix



ESPCs are a practical and flexible tool for obtaining energy improvements for federal facilities. While the ESPC master contract establishes general terms and conditions of the agreement between the agency and the energy service company (ESCO), the contract leaves broad latitude to custom-tailor a deal to suit the agency’s own particular needs, priorities, and circumstances.

The agency can negotiate the details of the savings guarantee and how optimum performance of the energy conservation measures (ECMs) will be ensured throughout the life of the contract. A full awareness of all the options and associated costs will help the agency negotiate a deal that uses the agency’s resources effectively, makes good business sense, and yields optimum value.



The subject of risks and responsibilities is, like M&V, integral to the whole subject of ESPCs. However, the risks and responsibilities addressed in this module are of particular interest at several points in the process:

- The preliminary assessment contains a Risk, Responsibility, and Performance Matrix (RRPM) showing the ESCO’s proposed approaches.
- The TO RFP may address related subjects.
- The proposal and task order must be reviewed with an eye to ensuring that they accurately reflect the approaches summarized in the final RRPM.
- During the performance period after project acceptance, the responsibilities taken by both the ESCO and agency must be carried out as specified in the contract to ensure that savings and performance are maintained.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

What is “Risk” in ESPC Context?

- **To ESCO – chance that guarantee will not be met and shortfall will be identified**
 - Will have to pay agency the difference
- **To agency – chance that savings you are paying for are not fully realized**
 - i.e., savings might not exceed payments

G-3

Federal Energy Management Program | femp.energy.gov

In the context of this discussion of the Risk, Responsibility, and Performance Matrix (RRPM), “risk” is defined in terms of financial consequences. To the ESCO, the risk is that the guarantee will not be met and the ESCO will be obligated to pay the agency for savings not delivered. To the agency, the risk is that savings it pays for will not be delivered, which violates the federal ESPC statute and regulation.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

What’s in an ESPC guarantee?

- A specified level of cost savings (one total dollar amount)
- Specified equipment performance (and standards of performance such as temp. and lighting levels)

What exactly is guaranteed depends on:

- Who takes risk/responsibility for what in T.O.
- The M&V plan – how savings will be determined

G-4

Federal Energy Management Program | femp.energy.gov

At the heart of an ESPC is a guarantee of a specified level of cost savings and performance. The customer is not obligated to pay for an unmet guarantee. The question is, what exactly is being guaranteed?

The answers to that question depend on the terms of the task order. The measurement and verification (M&V) plan defines how savings are calculated, which determines the savings guarantee in dollars, but the details of how savings are calculated can effectively assign risk to the agency or the ESCO. The M&V plan and all assignments of responsibility for operations, maintenance, repair, and replacement must take into account the decisions reflected in the RRPM.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

What is the Risk, Responsibility, and Performance Matrix (RRPM)?

- **A summary of key contract elements related to risks and/or responsibilities**
 - Each can be assigned to the ESCO, the agency, or shared
- **Required element of the contract (Attach. J-7)**
- **Risk/responsibility elements broken into three categories:**
 - Financial (usually mixed allocation)
 - Operational (usually agency)
 - Performance (ESCO)

G-5

Federal Energy Management Program | femp.energy.gov

The RRPM is an attachment to the ESPC master contract that discusses 14 areas of risk and responsibility in task orders. As an attachment to the Preliminary Assessment, the RRPM contains the ESCO’s proposed approach to each of these 14 areas. The RRPM in the proposal/task order summarizes the negotiated agreements between the agency and ESCO for each subject. Details of how each area is handled are found in other parts of the task order (especially the M&V plan).

The RRPM lists the risk factors in three categories: financial, operational, and performance. The RRPM addresses these variables and assigns risk and responsibilities to the appropriate parties.

Purpose of RRPM

- **Education about risks**
 - How contract elements affect costs and savings
 - How to tailor T.O. to match agency needs
- **Structure for decision making**
- **Documentation of agreements**
- **See RRPM in Case Study Book, p. 93**

G-6
Federal Energy Management Program femp.energy.gov

Most ESPCs are big-dollar, long-term deals involving shared responsibilities. All issues must be addressed during project development, before the task order is signed and the deal is set for the term of the contract.

The purpose of the RRPM is to help agencies:

- understand how key contract elements affect costs and savings,
- understand how to tailor the contract to match their own needs and priorities,
- give some structure to the decision making and negotiations, and
- document the decisions in these areas.

Understanding the risks and responsibilities and their assignment in the task order makes agencies better negotiators and administrators of the deal, as well.

The allocation of responsibilities between the agency and the ESCO defines who does what and who pays for what during the term of the contract. A few common-sense principles can be applied to the allocation of responsibilities:

- Logic and cost-effectiveness drive responsibility allocation.
- The responsible party then predicts its likely tasks and associated costs to fulfill its responsibility, and makes sure they're covered in the ESPC or the agency's budget (the government pays foreseeable costs).
- Unforeseen costs are paid by the party who caused the costs, or by the party who is responsible for that risk area.

Financial Risks

- **Construction costs**
- **M&V confidence**
- **Energy-related (one-time) savings**
- **Delays**
- **Major changes in facility**
- **Interest rates (covered elsewhere)**

G-7
U.S. DEPARTMENT OF ENERGY Energy Efficiency & Renewable Energy
Federal Energy Management Program femp.energy.gov

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Construction Costs

- ESPC is a design-build, fixed-price contract, so agency has little risk
- Design standards and review processes in the contract ensure that agency gets what is specified in the award
- Agency-initiated changes in scope, design standard, or schedule have to be negotiated as modifications to the contract

G-8

Federal Energy Management Program femp.energy.gov

The ESCO can control construction costs and guarantees a firm, fixed price for the project, typically taking bids and locking in subcontractor prices before submitting the proposal.

M&V Confidence



- **The agency pays the contractor for M&V services**
- **Need to balance savings certainty and M&V cost**
- **Law of diminishing returns applies**
- **Average annual M&V cost is 3% of annual savings**
- **Who takes most risk with Option A? The agency.**
 - But in many cases this is actually a good business choice for the government

G-9

Federal Energy Management Program femp.energy.gov

In considering the wide range of M&V options and costs, the key questions are:

- (1) How much do I want to spend?
- (2) What degree of accuracy do I need?
- (3) What are the tradeoffs?

Some agencies want more detailed data to verify savings to a very high degree of confidence and are willing to pay the price. Those intent on getting as many improvements as possible (to generate more savings) can take a practical but less expensive approach.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

One-Time Energy-Related Savings (Implementation-Period Savings/Payments)

- **Issues**
 - Including one-time cost savings before the money has been appropriated
 - But be careful: an FY appropriation can disappear if project isn't awarded within that FY
 - One-time savings must be based on actual spending reductions
- **What to do**
 - Clarify sources of non-energy cost savings and how they will be verified

G-10

Federal Energy Management Program femp.energy.gov

The agency and the contractor may agree that the project will include payments based on *one-time, energy-related (non-energy) savings*, matched by a one-time payment during the implementation period (before project acceptance). This may include one-time savings from avoided expenditures for projects for which funds were appropriated but will no longer be necessary because of the ESPC project. Committing to a one-time payment before the money has been appropriated may involve some risk to the agency.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

Delays

- **Whoever causes the delay pays for the delay**
- **ESCO at risk for extra costs if schedule is delayed**
- **Agency must adhere to review and approval schedules**

G-11

Federal Energy Management Program femp.energy.gov

The construction schedule should be detailed in the task order, including the timing of agency reviews and approvals of submittals such as designs, equipment specifications, and the commissioning report. The ESCO is highly motivated to complete the project on time so that payments can begin on schedule and the ESCO can in turn meet its obligation to begin payments for the financing of the project on schedule. Failing to do so entails significant financial consequences for the ESCO.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

Major Changes in Facility

- **ESCO can't be held responsible**
- **Understand that buildings' usage will likely change over two decades**
 - Be prepared to modify contract to reflect these changes
 - If a building is demolished, termination for convenience is sensible solution
 - If only one of several buildings in T.O., *partial* termination may make most sense

G-12

Federal Energy Management Program femp.energy.gov

Agencies that are certain that major changes are planned for some of their facilities should not pursue ESPC projects in those buildings, and buildings of questionable longevity should obviously not be included in improvement projects.

Even if a facility were closed during the ESPC term, the government's financial obligations would be only the usual ones associated with closing facilities. To keep financiers comfortable (and interest rates as low as possible), the contract should include pre-negotiated terms for retirement of debt upon termination for convenience.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

Operational Risks

- **Operating Hours**
- **Loads**
- **Weather**
- **User Participation**



G-13

Federal Energy Management Program femp.energy.gov

Operating hours, loads, weather, and user participation (or occupancy effects) may all affect energy usage and cost. In ESPC task orders, savings are calculated in relation to a baseline for each ECM that represents the energy and related costs that would have occurred if the status quo had been maintained and no new ECMs had been installed. The agency and the ESCO agree on the baselines for the ECMs, how they will be determined, and how savings will be calculated and compared to the guarantee for verification. The guarantee and the method for verifying savings must be documented in the contract in a way that accounts for potential impacts of operational factors.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Loads and Operating Hours — Agency Generally Takes These Risks

- **Agreeing to operational factors for calculating savings — based on engineering calculations and baseline measurements — is customary**
 - Guarantee is met if related requirements are met (performance standards, O&M)
- **TOs sometimes specify how baselines may be adjusted, when key changes are anticipated**
 - Example: Loads raised by expected occupancy increase

G-14

Federal Energy Management Program | femp.energy.gov

Over the term of the contract, if (for example) building occupants acquire no new electrical equipment that increases plug load, if the weather is not extreme, and if operating hours remain the same, the ESCO's estimates of energy savings will likely prove accurate and the guarantee will be met. However, if extreme weather occurs, if occupants increase the number of computers in use, or if a plant adds a second shift, energy usage will increase and savings may appear smaller than expected. Who is responsible for this increase in energy use under the contract? The agency, as the party with the greatest ability to cost-effectively control operational factors, generally takes financial responsibility. Even when the project doesn't totally eliminate potential cost increases from operational factors, it does minimize cost increases and make them more manageable than before the energy improvements were made.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Example: Operating Hours

- Agency and ESCO value lighting savings based on agreed-to operating hours, measured once in baseline
 - Along with before/after measured sample of fixture wattages
- To minimize risk: Base agreed-to values on measurements, where possible — not assumptions, unverified schedules, or loose observation



G-15

Federal Energy Management Program | femp.energy.gov

The agency generally assumes financial responsibility for operating hours and load in one of two ways:

1. **Baseline adjustments.** The contract can allow specified baseline adjustments for changes in operational factors so that savings calculated in relation to the higher baseline will better reflect the savings attributable to the new ECMs. Baseline adjustments must be supported by measurements.
2. **Stipulation.** Both parties can agree to operational factors (for the purposes of savings calculations) based on engineering calculations and preliminary measurements – and NOT rule-of-thumb estimates and anecdotal information, preferably. (This would be done by specifying Option A for verifying savings for the subject ECMs in the M&V plan.)

If related requirements are met (i.e., satisfactory commissioning results, maintenance tasks performed, and performance standards maintained), the guarantee is considered to be met. Operating hours and HVAC loads are often stipulated in this way. With well-proven, predictable technologies, stipulation is often the most practical choice.

To minimize the risk of accepting stipulated values related to operating hours or load, stipulations should be based on measured values rather than unverified assumptions, unverified schedules, or loose observation.

For more information on M&V Option A, see the *FEMP M&V Guidelines*.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Weather

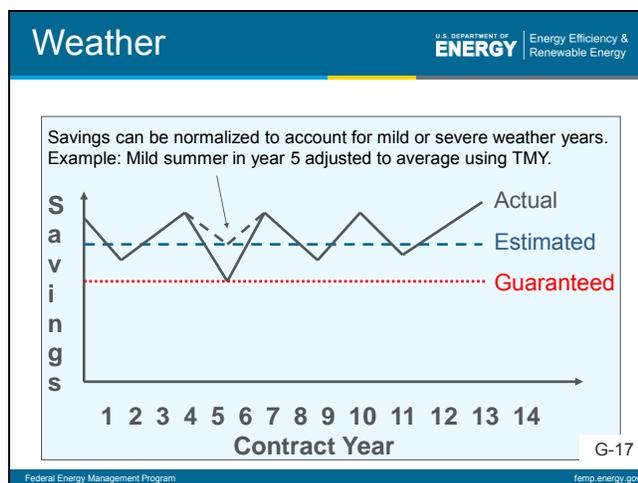


- **No one controls the weather**
- **Weather dramatically affects loads**
- **Weather is typically stipulated based on Typical Meteorological Year (TMY) data**
 - This “normalized” weather is based on 30-year averages and evens out savings shortfalls in mild weather years with excess savings of harsh ones
 - Keeps ESCO on hook for performance but *off* hook for anomalous weather

G-16

Federal Energy Management Program | femp.energy.gov

Only Mother Nature controls the weather, but it can be a major factor in energy usage. A sensible approach is to normalize calculations of the baseline and yearly energy savings to a typical weather year. In mild weather years, savings will seem small, but the energy bill will also be smaller than normal and the ESPC payment manageable, with funds to spare. In years of extreme weather, savings will exceed expectations, but despite higher utility bills it will be easier for the agency to manage and pay those bills than it would have without the project.



In this example, some of the lower actual savings in year 5 could be due to mild weather conditions. If so, an adjusted baseline may indicate that the savings were still met.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

User Participation

- Some measures require users to interact with equipment (or at least not override it) for proper operation
- Many task orders specify set points or other requirements
- If a measure does not work because the users do not use something as intended, is the contractor responsible?



G-18

Federal Energy Management Program | femp.energy.gov

Where user participation is required to generate savings, responsibilities can be assigned in one of several ways:

- the agency may accept the responsibility of training its own personnel to participate appropriately,
- the ESCO may agree to train agency staff to carry out assigned responsibilities, or
- the ESCO may agree to perform the required functions as part of the ESPC or a separate service agreement.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Performance

- Equipment performance
- Operations
- Maintenance
- Equipment repair & replacement

- **By contract, ESCO responsible for performance**
- **Assurances:**
 - Design and performance standards
 - Post-installation M&V
 - Commissioning
 - Defined consequences for substandard performance

G-19

Federal Energy Management Program | femp.energy.gov

Performance of the ECMs is the foundation of the guarantee and the value of the project. The ESCO is ultimately responsible for selection, application design, installation, and performance of the equipment, and must maintain specified standards of service (temperature, humidity, lighting levels, etc.).

To be negotiated and spelled out in the contract are: (1) how performance and standards of service will be verified; and (2) what the consequences for unacceptable performance and standards of service will be.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

O&M and Repair and Replacement (R&R) are major factors in performance risk

- **ESCO has ultimate responsibility for O&M — and assuring guaranteed performance of ECMs**
- **But day-to-day conduct of O&M and R&R are negotiable**
- **If ESCO does the work, it assumes all risk (and gets paid for it)**
- **If agency does the work, it assumes expense and possibly some of the performance risk**
 - Non-compliance with O&M and R&R plans and schedules can compromise the guarantee

G-20

Federal Energy Management Program | femp.energy.gov

Responsibilities for O&M and equipment repair and replacement (R&R) are negotiable and may be assumed by the ESCO, agency staff, or subcontractors. It is critical to spell out how proper performance of these functions will be ensured. Typically the agency operates the equipment with ESCO oversight. Maintenance can go either way, but the ESCO is always responsible for defining the maintenance program, providing training, and verifying execution.

Often the ESCO is responsible for R&R. However, the agency should negotiate whatever arrangement best addresses their needs. Some choose to keep all of these functions in-house to minimize the cost of the project; others lack the in-house capability or prefer to pay more for the “insurance” of having one responsible party for all these functions.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Factors to Consider

- Agency may opt to do O&M and R&R
 - Permits more investment
 - Consideration: existing O&M contracts
 - Best for ESCO to do R&R for unfamiliar ECMs (e.g., renewables)
 - If ESCO is responsible for R&R, it will likely assure O&M is done right



G-21

Federal Energy Management Program | femp.energy.gov

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

Future Energy Prices — Setting Escalation Rates

- **It's customary for agency to accept energy price risk in ESPC**
 - Future energy prices are normal agency risk anyway
- **There are down sides to both over- and under-estimating future energy prices**
 - Over-estimates lead to payments exceeding savings
 - But *under*-estimates lead to reduced scope and increased interest costs (due to longer project term)
 - Moreover, the reduced scope leaves site exposed to higher total energy rates

G-22

Federal Energy Management Program femp.energy.gov

Escalating utility rates is customary in ESPC.

Energy prices are not addressed by the RRPM, although they, along with usage, determine the dollar value of the energy-cost savings guaranteed by the ESCO. Since neither party has any control over energy prices, agencies and ESCOs generally opt for simple and practical ways to arrive at prices to use in savings calculations. A common and recommended practice is to stipulate current energy prices for the first year of the contract and use the FEMP/NIST Energy Escalation Rate Calculator (EERC) to determine energy rates for succeeding years. The calculator incorporates the energy forecasts of DOE's Energy Information Administration.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

Future Energy Prices — Setting Escalation Rates (cont.)

- **“Conservative” escalation rate is one that's accurate – NOT one that's artificially low**
- **Solution: FEMP/NIST Energy Escalation Rate Calculator (EERC)**
 - Calculates avg. escalations given state and term
 - Standard for setting escalation rates for federal ESPC and highly recommended by FEMP
 - Downloadable from “Resources” section of FEMP's Web site

G-23

Federal Energy Management Program femp.energy.gov

The chances that this approach will have serious financial consequences for the agency are very small. If prices turn out to be lower than expected, “savings” may be smaller on paper than projected, but the agency benefits from the lower prices and will be able to pay its bills. If energy prices are higher than projected, savings will exceed expectations, and the problem of higher prices will be easier to manage because the agency will be buying less energy than before the ESPC project.

Keep in mind that the primary purpose of the guarantee is to ensure that the agency will be able to pay all its bills — to the ESCO and for energy and related operations and maintenance (O&M) — from its annual energy and related O&M appropriations.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

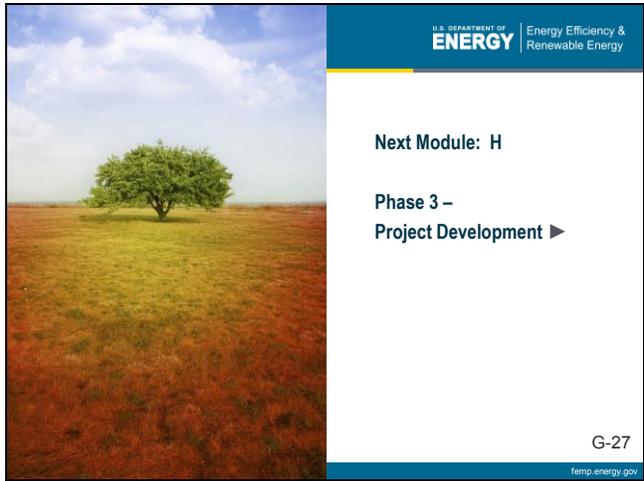
Lessons Learned on RRPM



- RRPM ensures that important risks are addressed and responsibilities assigned
- Dialog fosters mutual understanding of the deal
- Use the RRPM to guide proposal review — details in M&V plan and other parts should not conflict with RRPM
- Don't take a responsibility that your organization can't handle well!

G-24

Federal Energy Management Program femp.energy.gov



U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

Next Module: H

**Phase 3 –
Project Development ▶**

G-27
femp.energy.gov

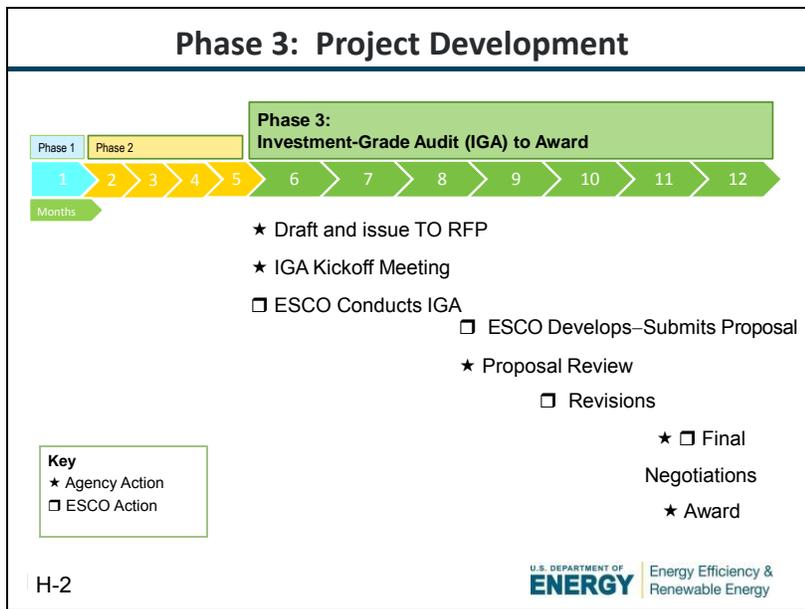
H – Phase 3 – Project Development – Overview of Process

Phase 3 – Project Development

**Overview of Process:
Investment-Grade Audit (IGA) and Proposal
Through Negotiations and TO Award**

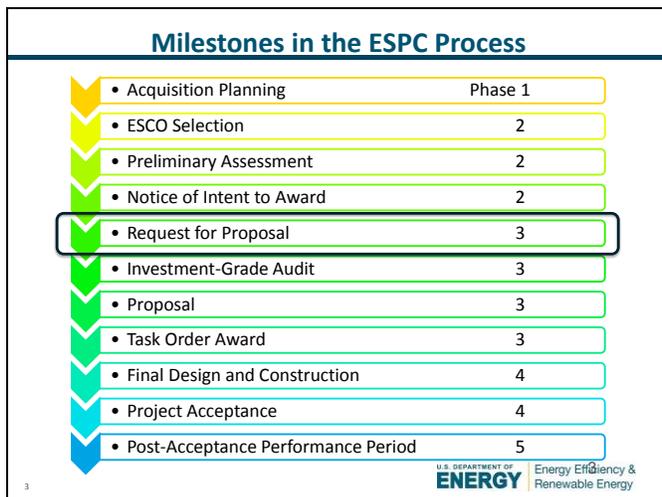
IDIQ Sections H.5, H.6, and H.7 address these parts of the ESPC process:

- H.5 Investment-Grade Audit Content Requirements for Task Orders
- H.6 Requirements for Proposal And Proposal Review for Task Orders
- H.7 Requirements for Competitive Financing Acquisition for Task Orders



Having been given a Notice of Intent to Award, the ESCO is in a position to begin **conducting the IGA** and preparing the proposal. The ESCO’s proposal is the basis for negotiating the final terms and conditions of the task order. The proposal provides a complete technical description of the project and a price proposal.

Notwithstanding the NOI issued by the agency, award to the ESCO is still conditional upon the proposal’s conformance to all requirements defined in the IDIQ (as modified by the TO Request for Proposal) and upon successful negotiation and agreement on the requirements of the TO and the content of the proposal. Award is also contingent upon the ESCO’s ability to meet several other pre-award requirements that are defined in the IDIQ contract.



The Task Order RFP (TO RFP)

- Purpose: Incorporate site-specific requirements into TO by modifying, adding to, or deleting IDIQ contract terms
- One RFP issued by agency only to selected ESCO – results in one proposal
 - Many IDIQ clauses call for specifics to be spelled out in TO-RFP
 - TO-RFP can add requirements not addressed by IDIQ
 - TO-RFP language supersedes IDIQ language

H-4



TO RFP

The FEMP-DOE ESPC IDIQ contracts are intended to be flexible and to accommodate the particular requirements of the ordering agencies. Agencies use the TO RFP to tailor the IDIQ contract to their needs and circumstances by incorporating into the task order all necessary agency-, site-, and project-specific standards, procedures, functional requirements, terms, and conditions, and to communicate these requirements to the ESCO.

Some provisions must be addressed in the TO RFP to include agency-specific information, such as contact information and invoicing procedures.

In large part the RFP will be documenting the agency’s ongoing discussions with the ESCO, from the PA review through the present.

Agencies generally use the TO RFP to specify

- how operations and maintenance (O&M) and equipment repair and replacement (R&R) is to be handled;
- special environmental, safety, and health requirements; and
- compatibility requirements for design drawings, among other requirements.

The terms of the TO RFP and the TO override the terms of the IDIQ contract, as long as they remain within the IDIQ scope, period of performance, and contract ceiling.

TO RFP Template

- The TO-RFP template lists IDIQ sections that require additions or amendments to specify agency-, site-, or project-specific requirements
- Minimizes time and effort required for TO RFP development
- Template follows numbering of IDIQ
- Your Project Facilitator will help draft the RFP

H-5



FEMP provides a prescriptive template for the TO RFP to minimize the time and effort required for TO RFP development. The template identifies and shows the IDIQ provisions that usually require additions or amendments to specify agency-, site- or project-specific requirements.

The template lists the provisions by number, in the order in which they appear in the contract. Using the template precludes the need to review the entire IDIQ contract in order to determine what should or must be addressed in the TO RFP. Also, ESCOs and others are familiar with the template, and this standardized process expedites the project.

Only the contract provisions that are to be altered or supplemented need to be addressed in the TO RFP. Any provision of the ESPC may be altered, unless alteration is specifically prohibited.

Subcontracting Goals

The TO RFP should include an indication of the subcontracting goals that the agency wants the ESCO to meet in the Task Order. The IDIQ contract includes a Master Subcontracting Plan for each ESCO which establishes overall goals required for all Task Orders issued against the contract during its term.

The agency contracting officer or acquisition team, however, may establish achievable goals for the project Task Order efforts based on the composition of their project. At this point the project will be sufficiently defined to permit identification of the subcontracting goals. This will be another item negotiated and included in the award. The TO RFP prescriptive format provides direction for this as well.

One Section From TO RFP Template: C.21

C.21 SECURITY REQUIREMENTS
Specify any different or additional site- or agency-specific safety requirements. Consider local process and requirements.

- IDIQ language is acceptable.
- IDIQ language is acceptable, with the noted additional requirements.
- Replace the IDIQ language as noted.

C.21.1 Passes and Badges - All contractor employees shall obtain employee and vehicle badges and passes, as required by the agency, for the specific TO project site prior to the start of on-site work. The agency will issue badges it requires, without charge, and the badges must be worn, clearly visible, by the employees at all times while on site. When an employee leaves the contractor's service, or when access is no longer required, the employee's pass and badge shall be returned in accordance with agency requirements.

C.21.2 Contractor Vehicles - Each contractor vehicle shall display the contractor's name such that it is clearly visible. The agency may issue vehicle passes as it determines, and these shall also be displayed so as to be clearly visible.

C.21.3 Contractor Access to Buildings - It shall be the contractor's responsibility, through the agency, to obtain access to buildings on the TO project site.

H-6 

The TO RFP Will Evolve With the Project

- Before the TO RFP is incorporated into the task order, it must be revised to incorporate negotiated changes in the IGA and/or proposal resulting from ongoing discussions (and informal negotiations).

H-7 

Revision of the TO-RFP

The RFP must be revised to incorporate changes in the IGA/proposal resulting from ongoing discussions and informal negotiations leading up to a final task order and award.

Consult the Resident Experts

Those developing the TO RFP must consult with their site support organizations in order to properly identify and address the site’s requirements in the TO RFP.



H-8



It is important for those developing the TO RFP to communicate with site support organizations to accurately identify all requirements and to ensure that the wording in the TO RFP addresses those requirements correctly.

A note on coordinating team efforts: These experts may be the same people you will want to review parts of the proposal and final TO RFP before award.

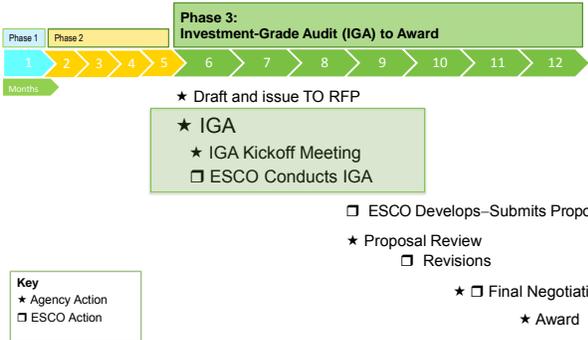
Milestones in the ESPC Process

• Acquisition Planning	Phase 1
• ESCO Selection	2
• Preliminary Assessment	2
• Notice of Intent to Award	2
• Request for Proposal	3
• Investment-Grade Audit	3
• Proposal	3
• Task Order Award	3
• Final Design and Construction	4
• Project Acceptance	4
• Post-Acceptance Performance Period	5

9



Investment-Grade Audit



★ Draft and issue TO RFP

★ IGA

★ IGA Kickoff Meeting

□ ESCO Conducts IGA

□ ESCO Develops-Submits Proposal

★ Proposal Review

□ Revisions

★ □ Final Negotiations

★ Award

Key

★ Agency Action

□ ESCO Action

H-10



**The Investment-Grade Audit (IGA):
The Basis for the Proposal**

- Augments, refines, and updates the PA data
- Establishes energy and O&M baselines
- Some IGA findings may differ from agency expectations and from assumptions in PA

H-11



The IGA is the documented basis for the technical and price sections of the proposal.

The IGA augments, refines, and updates the preliminary site survey data and provides the information needed to establish the energy and O&M baselines and update the feasibility analyses of the ECMs under consideration. Such information is also used to verify or adjust the estimated annual cost savings and confirm the contractor’s ability to structure a project with an acceptable term, with guaranteed annual cost savings that cover the firm-fixed-price contractor payments.

The ESCO integrates findings from the IGA and the results of the financing acquisition with the requirements stated in the IDIQ and TO RFP to produce the proposal. Findings of the IGA are usually submitted as part of the proposal. The proposal addresses ECMs considered, their feasibility, energy savings calculations, rationale for ECM selection, costs to implement each ECM with detailed backup information, and annual cost savings of each ECM with detailed supporting data.

Kickoff Meeting for IGA

- Kickoff is hosted by site, facilitated by PF
- A true partnership between the agency and ESCO from this point forward is necessary to develop the best possible project
- Agency should share all relevant information with ESCO
 - Tell the ESCO what you want
 - The more detail the ESCO has, the better he can address agency’s needs



H-12



The ESCO completes an investment-grade audit (IGA) as part of developing the proposal. The project facilitator can facilitate the kickoff meeting, helping to establish roles, responsibilities, timelines, and communications protocols, and a plan for coordinating the process of reviewing the proposal.

Kickoff Meeting Agenda Items

- Introduction of new staff
- Milestones and schedule through TO award
- Access and security procedures
- Communication protocols
- Requirements for IGA report and proposal (e.g., content, level of detail)
- Agency/site-specific requirements in TO RFP

H-13



A sample agenda for an IGA kickoff meeting is posted on FEMP ESPC Resources Web page.

At a minimum the kickoff meeting should ensure that agency and ESCO agree on:

- The schedule going forward
- Buildings included in scope
- Required ECMs
- General O&M approach
- General M&V approach
- Commissioning

H-14



IGA Process and Best Practices

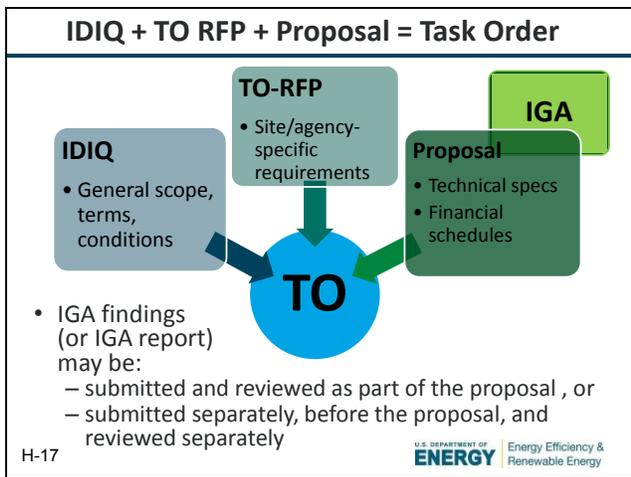
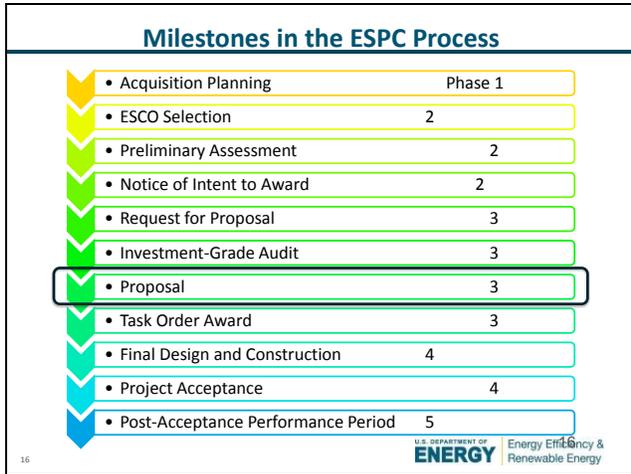
- Agency facilitate site access for multiple ESCO site visits
 - Have site experts available
- Bi-weekly meetings of ESCO and agency during the IGA can keep all parties on the same page
- Agency should continue to share any new or changed information with ESCO
 - Scope revisions; problems and opportunities

H-15



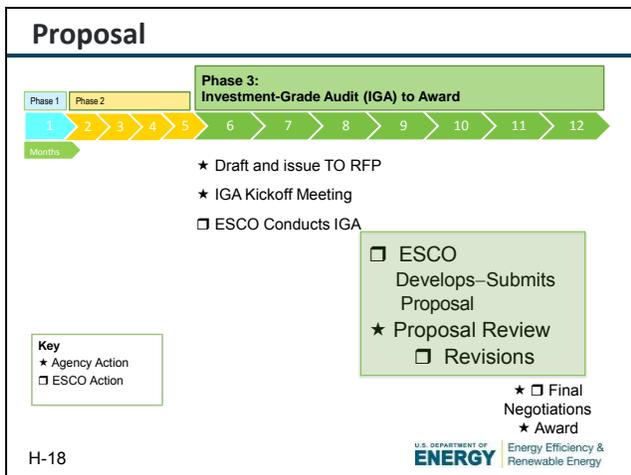
The ESCO usually sends a team of engineers led by a senior project developer to perform the IGA of facilities and energy systems at the project site. The agency is expected to provide an escort and/or arrange for access to the buildings to be surveyed.

ESPC is a departure from “business-as-usual” contracting, and its success depends on a working partnership between agency and ESCO. At any time during project development, and especially when the TO RFP is taking shape, each party should be happy to disclose findings that could affect the development of the TO RFP and the project in general. This can prevent delays and ensure that the project moves forward efficiently, saving money for the both the agency and the ESCO.



The IDIQ, TO RFP, proposal (including IGA results), and agency-required procurement documents comprise the task order.

The ESCO often submits detailed IGA findings as part of the proposal, but in some cases the ESCO will submit an IGA report before the proposal for agency review and approval.



The ESCO’s proposal is the basis for negotiating the final terms and conditions of the task order. The proposal provides a complete technical description of the project and the price proposal.

The proposal content is specified in the IDIQ contract (H.6) and may be modified as allowed by the TO RFP. Negotiations to achieve agreement on a final task order are based on the proposal and any other post-IGA submittals.

The price proposal includes revised schedules from the PA and completed (negotiated) schedules, as required by the IDIQ.

Proposal: Basis for Negotiating the TO

- The proposal integrates
 - IGA findings (Technical Proposal)
 - Requirements of TO RFP and IDIQ
 - Financial (TO) schedules (Price Proposal)
- Negotiations to achieve agreement on the task order are based on the proposal and any other post-IGA submittals.
- Proposal contents are per IDIQ H.6

H-19 

Contents of Proposal, per IDIQ H.6 (Summarized)

- Project Overview
- Volume I: Technical Proposal
 - ECM Descriptions and Performance
 - Measurement
 - Management Approach
- Volume II: Price Proposal
 - TO schedules and supporting detail for pricing
 - Financing
- Subcontracting Plan

Agency Review of Proposal – Introduction



Phase 3: Investment-Grade Audit (IGA) to Award

- ★ Draft and issue TO RFP
- ★ IGA Kickoff Meeting
- ESCO Conducts IGA

ESCO Develops-Submits Proposal
 ★ Proposal Review
 Revisions

Key
 ★ Agency Action
 □ ESCO Action

★ Final Negotiations
 ★ Award

> This module provides only an introduction to the review process and best practices
 > Details of proposal review are covered in next modules on:

- ECMs and Management Approach
- Financial Schedules
- Financing
- Pricing

H-20 

Review of Proposal and IGA Findings

- Don't be confused about ESPCs – **Agency must review every word of contract before awarding:**
 - Proposal – IGA – TO RFP – IDIQ
- Revisions will likely be necessary before award
 - Agency comment ➔ ESCO response ➔ Resolution
 - Require ESCO to show/track required changes in revised version(s) of proposal

H-21 

The agency's careful review of the IGA report and proposal, as in any contract obligation, is critical in preparing for negotiating the final task order and ensuring that the agreement is a good business deal for the government. A thorough and systematic review before accepting the offer is imperative.

Review every word before awarding:

Document evaluation team's comments and requests for changes, and make sure required changes agreed to and transcribed into the TO and/or documented in file.

Require ESCO to show/track required changes in revised version(s) of proposal.

Review Process and Best Practices

- Convene the evaluation team
 - Assign parts of proposal to appropriate personnel
- Establish process and schedule with team and ESCO
- Assign appropriate priority and resources to review tasks
- Deliver on schedule (Don't incur costs for delays!)
- Use your PF and FEMP ESPC resources
- COs: Think ahead to approval process

H-22

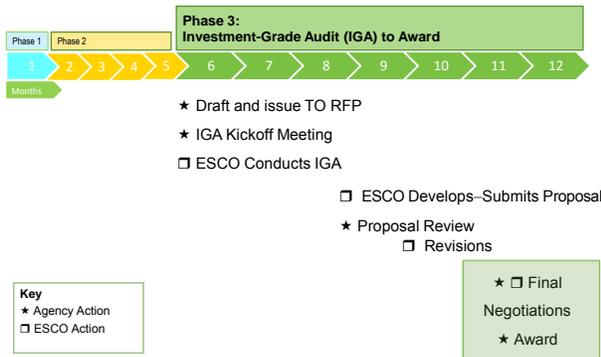


The review of each of the proposal sections requires coordination between members of the acquisition team, with different team members assigned to review parts of the proposal for which they have relevant expertise.

Developing a review plan and setting aside focused review time greatly assists the team in making a thorough and timely review.

Some experienced COs have found that the best strategy is to put all the reviewers in a room and get them to agree to stay there until the review is completed.

Final Negotiations to Award



★ Draft and issue TO RFP
 ★ IGA Kickoff Meeting
 □ ESCO Conducts IGA
 □ ESCO Develops-Submits Proposal
 ★ Proposal Review
 □ Revisions
 ★ □ Final Negotiations
 ★ Award

Key
 ★ Agency Action
 □ ESCO Action

H-23



Negotiation of Final Task Order

Negotiations to a task order award have both informal and formal aspects. Informal negotiations are ongoing, beginning with the first kickoff meeting and continuing throughout the development of the proposal, as the ESCO and agency discuss the project details and the agency's needs and preferences.

Most of the issues regarding technical matters, such as ECMs, equipment, and selection of subcontractors, are generally settled in these informal, ongoing communications and are reflected in the proposal text. The agency and ESCO arrive at agreement over any remaining technical and price issues in negotiations led by the agency CO.

Negotiations/Reviews: Proposal → Task Order

- For the CO, negotiations for a firm-fixed-price ESPC task order are essentially the same as any other price negotiation
 - Review of proposal (revisions as necessary)
 - Revision of TO RFP to capture all negotiated changes
 - Agreement on TO (financial) schedules
- **Remember — no action is an action.**

H-24



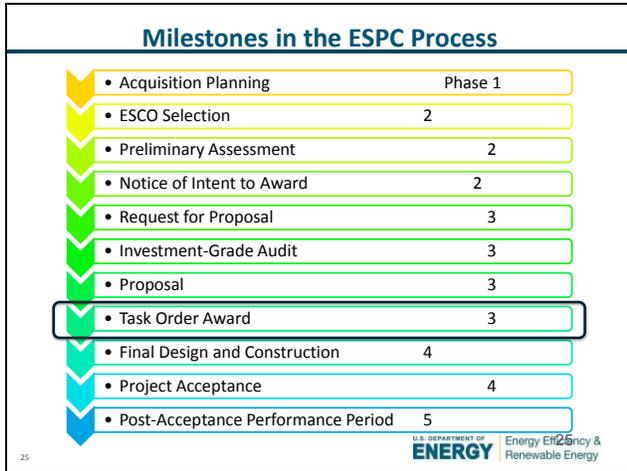
All agreements must be incorporated into the ESCO's proposal, the TO RFP, or both, in order to be considered binding.

After agreement is reached on the three technical components of the proposal — ECMs and energy savings, baseline and M&V plan, and management plan — the ESCO may need to revise some of the wording in the proposal to clarify the agreements.

In many cases, by the time the agency contracting officer and ESCO sit down for formal, final negotiations, all parties are confident that no significant unresolved differences remain and that they are ready to sign the task order. Final negotiations result in agreement on all aspects of the offer including price.

Updating the DO RFP for the Final Task Order

Since the TO RFP, together with the IDIQ contract and proposal terms, comprises the TO award, and because the TO RFP supersedes other terms and conditions, the TO RFP must be updated from a solicitation document to one that reflects the final negotiated terms and conditions of the award. Any provision may be added, deleted, or changed as necessary at this point to reflect negotiations.



Preparing for Award



- Pre-award requirements met?
 - Financing and bonding (as required)
 - Negotiations in good faith
- Contract clearance reviews
- Obtain approvals and complete file documentation consistent with agency procedures
- Get authorization from DOE Golden CO

H-26 U.S. DEPARTMENT OF ENERGY Energy Efficiency & Renewable Energy

The IDIQ defines several requirements that must be met by the ESCO before the task order is awarded. Completing the IGA, revising the ECM feasibility analysis, delivering the proposal, and negotiating in good faith to a final accepted task order are among these requirements. The ESCO must also provide evidence that financing and bonding (if required) are committed.

The agency notifies the DOE IDIQ CO (at DOE Golden Office) of the intent to award and provides copies of the task order. The DOE IDIQ CO reviews the task order for compliance with IDIQ scope, ceiling, and period of performance and sends a letter authorizing the agency to award.

Award of Task Order

- TO is signed and awarded by the agency CO
- TO incorporates the IDIQ contract
- Award document consists of:
 - Agency’s task order document
 - TO RFP, revised per negotiations
 - ESCO’s (revised) proposal
 - Subcontracting plan

H-27



Next: Module I
Review of the Proposal – ECMs and Management Approach
(The Technical Proposal)



H-30 Lassen National Park Visitors Center



I – Proposal Review– ECMs and Management Approach

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Review of the Proposal

I – ECMs and Management Approach (this module)

- J – Costs and Financial Schedules
- K – Financing
- L – Pricing

In this module we discuss review of the “technical proposal.” In the next three modules we discuss other aspects of proposal review: costs and financial schedules, financing, and pricing.

The proposal represents the culmination of work performed by the ESCO during the investment-grade audit (IGA) and project development. In addition to including the findings of the IGA, the proposal captures the requirements specified by the ordering installation in the Task Order Request for Proposal (TO RFP). The format for the proposal can also be specified in the TO RFP.

The acquisition team should first organize themselves and decide who the key reviewers will be for each major section of the proposal. Then the acquisition team and any supporting organizations need to plan for the review. The team should be prepared to do a thorough review of the entire proposal and deliver comments to the ESCO on schedule.

Milestones in the ESPC Process

• Acquisition Planning	Phase 1
• ESCO Selection	2
• Preliminary Assessment	2
• Notice of Intent to Award	2
• Request for Proposal	3
• Investment-Grade Audit	3
• Proposal	3
• Task Order Award	3
• Final Design and Construction	4
• Project Acceptance	4
• Post-Acceptance Performance Period	5

U.S. DEPARTMENT OF ENERGY Energy Efficiency & Renewable Energy

This module focuses on the Technical Proposal

- Volume I: Technical Proposal
 - ECM Descriptions
 - ECM Performance Measurement
 - M&V Plan and energy/O&M baselines
 - Commissioning approach (not full plan)
 - Management Approach
 - Organization, RRRPM, O&M/R&R, Training

I-3
Federal Energy Management Program fem.gov

Both parties benefit from a timely turnaround in the proposal. The acquisition team and supporting staff should develop a schedule and adhere to it. However, the agency must do a thorough review of the proposal to understand the ESCO’s approach and avoid problems during the performance period.

Generally the first step is to perform a cursory review to ensure that it addresses all of the required information. If proposal contents are deficient, the team should promptly notify the ESCO and request either submission of the missing elements or resubmission of the entire proposal, depending on the amount of missing information.

Requirements for proposal contents are defined in section H.6 of the IDIQ.

U.S. DEPARTMENT OF ENERGY Energy Efficiency & Renewable Energy

Review of ECM Descriptions

- Complete and understandable ECM descriptions should specify:
 - Affected location (building, area within building, affected floor area, etc.)
 - Potential interfaces with existing government equipment
 - Information on brand, model, size, including catalog “cut sheets”
 - All utility interruptions or physical changes to existing equipment or facilities required to implement ECMs

I-4
Federal Energy Management Program fem.gov

ECM Descriptions

The heart of the proposal pertains to the work scope. Reviewers should review the list of recommended ECMs and ensure that they still make sense, are aligned with current project goals and expectations, and are acceptable, and then determine whether each ECM is adequately described. Generally, one should be able to read the description and have a basic understanding of current practices, recommended actions, and how energy savings will be achieved.

- Is each ECM description complete and understandable? Is one left with a clear understanding of what is currently being done, what is being recommended, and how energy savings will be achieved?
- Does it specify what physical location(s) at your facility will be affected?
- Does it specify any potential interface with existing government equipment?
- Does the description provide sufficient information pertaining to brand, model, and size, and does it include catalog “cut-sheets” for the equipment?
- Does the description provide sufficient information pertaining to any required utility interruptions or physical changes to existing equipment or facilities that will be required to implement ECMs?

If the answers are yes, the agency can be reasonably certain that the ESCO has adequately addressed this required element of the proposal.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

**Review energy and cost savings carefully
— they are the basis for the savings guarantee**

- The proposal shows for each ECM
 - Projected energy and energy cost savings
 - Projected energy-related cost savings
- ESCOs (almost) never guarantee 100% of estimated savings
 - Guaranteeing less is a safety net
 - Portion guaranteed depends on complexity of ECMs, predictability of savings, M&V type, O&M/R&R, other

I-5

Federal Energy Management Program | femp.energy.gov

Energy and Cost Savings

The format for proposal requires the ESCO to provide detailed engineering calculations supporting basis for guaranteed savings for each ECM. The ESCO should compile these supporting calculations in a logical format that starts with methodology, then proceeds to assumptions, followed by the calculations themselves.

After the review team is satisfied with the reasonableness of the energy savings calculations for each proposed ECM, they should review cost savings calculations.

Traceability of energy and cost savings is critical in the review of the proposal. Reviewers should ensure that each energy and cost savings estimate is properly identified and transferred to Schedule TO-4 of the price proposal.

The unit cost of energy for each fuel source must be mutually agreed upon by the ESCO and agency. Legislation states that the unit cost of fuel used in performance contracting projects must be the rate in effect at the time of project development. However, for most federal facilities, there are two tiers of rates.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

Reviewing Engineering Calculations and Assumptions

- Government review to establish:
 - Rationale/ basis for savings is reasonable
 - Based on sound engineering principals
 - Correct (i.e., check the math, spot-check large repetitive spreadsheets)
- Review of assumptions
 - All should be documented
 - You can't know that savings estimates are realistic if assumptions are invalid !

I-6

Federal Energy Management Program | femp.energy.gov

To review energy savings, the agency should do the following.

1. Review the ESCO's basis for energy savings and determine whether it appears to be reasonable. Then check the percentage savings compared to the baseline and determine whether it is realistic.
2. Review the proposed methodology for calculating savings and determine whether it is based on sound engineering principals. When satisfied with how savings are to be determined, perform a thorough review of all proposed assumptions and determine whether they are realistic.

3. Review the engineering calculations (i.e., check the math). On a large spreadsheet-based calculation (common with lighting upgrades) spot checks can satisfy this requirement. It is highly recommended that a representative calculation that demonstrates what the spreadsheet is doing internally be included in the discussion of the spreadsheet.

Two types of assumptions must be reviewed: those related to operations and those related to performance. Operations-related assumptions deal with occupancy, operations schedules, temperature set-points, large internal loads, etc. Generally building tenants can provide reliable corroboration or correction of these assumptions.

Assumptions related to performance deal with equipment efficiencies, equipment loading, etc. Engineering representatives on the acquisition team, project facilitators, or FEMP ESPC Team specialists are typically best qualified to validate these assumptions. It is imperative that the agency review all assumptions for acceptability to ensure that projected energy savings will be achieved.

If the ESCO provides energy savings calculations in the form of a building energy simulation model, both the input and output data should be reviewed for reasonableness. To allow for an independent review of the model, the agency should require the ESCO to provide both input and output files, preferably on disk along with the proposal.

Operational and performance-related assumptions should be extracted and reviewed for reasonableness, and the accuracy of the baseline model (i.e. current system configuration and operation) should be verified. FEMP recommends that the support staff from the DOE national laboratories should be consulted for review of non-standard ECMs. It is up to reviewers to ensure that the correct rate is applied and the arithmetic is correct. At minimum, the ESCO must provide the unit cost of fuel for each source on Schedule TO-4 (typically provided in an appendix to the proposal).

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Spreadsheets and Building Energy Simulations

- No black boxes!
- Building energy simulations
 - An acceptable way to document annual energy savings
 - Require input/output data to be provided on disk with proposal

I-7
Federal Energy Management Program femp.energy.gov

- Spreadsheet-type calculations should include a stand-alone sample which documents the workings of the spreadsheet itself
- Building energy simulations are an acceptable way to document annual energy savings
- Energy simulations in proposals should be supported with both input and output data
- To facilitate independent verification of model's accuracy, agency can require input/output data to be provided on disk with proposal

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

O&M Savings

- Defined: A reduction in costs for operation and/or maintenance resulting from installation of new ECMs
- Savings for both labor and materials are acceptable
- Verify that ESCO estimates of O&M savings comply with FEMP and agency guidance on acceptable O&M savings

I-8
Federal Energy Management Program femp.energy.gov

Payments for an ESPC can also come from one-time or recurring energy-related cost savings. Recurring savings generally result from reduced O&M expenses. One-time cost savings can result from the avoided expenditures of O&M funds for projects that were budgeted but, because of the ESPC project, will not be necessary.

O&M savings are derived as energy savings are. The ESCO typically quantifies what is currently being spent on O&M activities for pre-retrofit conditions. This can be done by reviewing O&M logs provided by the ordering installation, then the ESCO determines O&M costs for the proposed equipment, typically by applying time and labor costs to the

equipment manufacturer’s recommended preventative maintenance procedures.

The reviewer may be able to evaluate the baseline determination through review of O&M log data and validate the post-retrofit costs using R.S. Means data pertaining to actual task descriptions, frequency and duration of tasks, and the probability of large-scale failure and/or repair.

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

**Summary:
Review of ECM Energy and Cost Savings**

- Thorough review includes:
 - Validation of calculation methods and arithmetic
 - Validation of assumptions and building energy simulations
 - Validation of unit costs of energy and labor rates
 - Verification that energy and cost savings for each ECM are properly identified in Schedule TO-4
- Note that FEMP ESPC team experts can help with review of advanced technologies

Federal Energy Management Program | femp.energy.gov | I-9

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Evaluating ESCO’s Management Approach

- ESCO’s organizational structure
- Risk, Responsibility, and Performance Matrix
- Proposed level of O&M services
 - Does it address site needs?
- Proposed repair and replacement services
 - Do responsibilities meet site requirements?
- Project timeline
 - Are they well-suited for successful implementation?

Federal Energy Management Program | femp.energy.gov | I-10

Management Plan

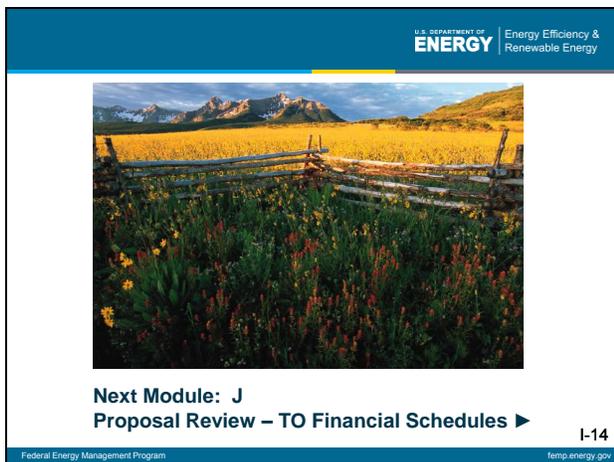
The management plan consists of the ESCO’s organizational structure for the project, the Risk and Responsibility Matrix, the proposed level of O&M services, the proposed R&R services, and a project timeline. In addition, the ESCO is required to furnish a Small Business Subcontracting Plan to outline their practices in hiring subcontractors, if required by the agency. Each of these components should be reviewed carefully, as they will become the contractual basis for the performance period of the contract. Be sure there is sufficient detail — consider someone reading this contract five years from now and trying to understand who is responsible for each piece of equipment.

The services outlined in the management plan and in the M&V section provide most of the backup and substantiation for the performance-period pricing shown in the financial schedules. Often there is

considerable negotiation of the service levels since the investment in ECMs and the TO term are directly affected by the performance-period costs.

Consider the following review criteria:

- Project management approach and timeline are well suited for successful project implementation.
- Operations and maintenance plan addresses site requirements.
- Repair and replacement responsibilities address site requirements.



J – Proposal Review – TO Financial Schedules

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

**Proposal Review —
TO Financial Schedules**

Solar array at Oak Ridge National Laboratory

J-1

Federal Energy Management Program | femp.energy.gov

Milestones in the ESPC Process

• Acquisition Planning	Phase 1
• ESCO Selection	2
• Preliminary Assessment	2
• Notice of Intent to Award	2
• Request for Proposal	3
• Investment-Grade Audit	3
• Proposal	3
• Task Order Award	3
• Final Design and Construction	4
• Project Acceptance	4
• Post-Acceptance Performance Period	5

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Cost Elements of ESPCs

Project Development	• Energy surveys, proposals
ECMs	• Direct costs for design, installation/construction
Indirect Costs	• e.g, overhead and profit
Financing	• Interest, financing procurement costs
Performance-Period Services	• O&M, R&R, M&V

J-3

Federal Energy Management Program | femp.energy.gov

The TO schedules are prepared in accordance with the instructions in Section H.6.C of the IDIQ contract, which describes the proposal, and IDIQ Attachment J-5, *Descriptions of Task Order Schedules and Placement of Pricing Information*. The ESCO revises its preliminary assessment schedules (TO-2, TO-3 and TO-4) for the proposal. Schedules TO-1 (Final) and TO-5 are completed just for the preliminary assessment.

The price proposal is required to include supporting information pertaining to direct expenses for project implementation and performance-period expenses shown in the TO schedules and included in the price proposal.

**Task Order Financial Schedules:
The Cut-to-the-Chase Project Description**

All costs appear in the TO schedules

J-4

Federal Energy Management Program | femp.energy.gov

The final, negotiated TO financial schedules are a key component of the proposal. These five schedules detail the financial deal and the project in numbers, both in terms of energy and dollars.

These schedules are Attachment J-6 to the DOE IDIQ, and the ESCOs are required to use these forms.

The final price proposal includes the following:

- Schedules TO-2, TO-3 and TO-4 , revised from the preliminary assessment as a result of IGA results and negotiations

- Completed TO-1 (Final) and TO-5
- Supporting information on
 - Direct expenses for implementation
 - Performance-period expenses
 - Financing procurement price

Schedule	Description	Office that uses the Schedule
TO-1	• Guaranteed annual cost savings & annual contractor payments (savings and payments by year)	Lawyers, COs, Leadership,
TO-2	• Implementation price by ECM (investment costs)	Contracting, Price Analysts
TO-3	• Performance-period cash flow (financing info, annual cash flows)	Budget, Finance, Resource Managers
TO-4	• First-year energy & cost savings by ECM and tech category (savings breakout by ECM)	Energy Managers, Engineering, Facility Managers
TO-5	• Annual cancellation ceiling	Leadership

J-5

This chart lists the TO schedules, with descriptions of their contents, and the agency organizations that are typically most interested in each schedule.

The TO schedules are prepared in accordance with the instructions in Section H.6.C of the IDIQ contract, which describes the proposal, and IDIQ Attachment J-5, *Descriptions of Task Order Schedules and Placement of Pricing Information*.

The ESCO revises schedules TO-2, TO-3 and TO-4 from the preliminary assessment for the proposal. Schedules TO-1 (Final) and TO-5 are also completed for the proposal. TO-1 is often completed for the preliminary assessment even though not required, because it summarizes project savings and payments, thus showing whether the project will cash flow.

The price proposal is required to include supporting information pertaining to **all** expenses for project implementation and performance-period expenses shown in the TO schedules and included in the price proposal.

ESPC: Purchasing Savings

- The government buys a basket of savings
 - TO-1 – Annual Cost Savings & Payments
- The basket is detailed by ECM
 - TO-4 – First-Year Energy & Cost Savings by ECM and Technology Category
- The guarantee is for one total amount of cost savings (not for individual ECMs)
- The government pays for savings as they accrue

J-6

Federal Energy Management Program femp.energy.gov

TO-1

SCHEDULE TO-1 (final)

GUARANTEED COST SAVINGS AND CONTRACTOR PAYMENTS

IMPORTANT INFORMATION

(1) This schedule is not to be altered or changed in any way. Please note any clarifications in the comments/explanations area below.

(2) The first year post-acceptance performance period estimated annual cost savings reflect technical proposal and engineering estimates as presented in TO-4.

(3) The guaranteed annual cost savings are based on the general description of M&V plan proposed for the project.

(4) The total of contractor payments (columns c and f) represents the TO price and should be supported by information submitted in and provided with Schedules TO-2 and TO-3.

(5) If applicable, prior to post-acceptance performance period, implementation period allowable payments and energy savings are one-time amounts only.

(6) If applicable, provide a separate table showing proposed energy rates (i.e., E&W, S&W, S&M&U) for each post-acceptance performance period year, derived using the National Institute of Standards and Technology Handbook 130 and Annual Supplement or other appropriate methods. Also, submit escalation rates applied to energy-related O&M savings (including water and sewer) _____ % per year.

(7) The proposed guaranteed cost savings during the implementation period and post-acceptance performance period must exceed the contractor payments.

(8) [Reserved]

(9) [Reserved]

(10) If selected, the contractor shall complete the installation of all proposed ECMs not later than _____ months after TO award.

Task Order No.	Contractor Name	Project Site	(a)	(b)	(c)
			Estimated Cost Savings (\$)	Guaranteed Cost Savings (\$)	Contractor Payment (\$)
			275,122	280,239	280,238.99
Implementation Period			(d)	(e)	(f)
Post-Acceptance Performance Period Year			Estimated Annual Cost Savings (\$)	Guaranteed Annual Cost Savings (\$)	Annual Contractor Payments (\$)
Year 1			840,489	795,022	750,021.32
Year 2			862,890	816,211	816,210.07
Year 3			885,888	837,965	837,963.53
Year 4			909,498	860,298	860,296.76
Year 5			933,738	883,226	883,225.21
Year 6			958,623	906,768	906,764.75
Year 7			984,172	930,933	930,931.65
Year 8			1,010,402	955,744	955,742.64
Year 9			1,037,331	981,216	981,214.90
Year 10			1,064,978	1,007,367	1,007,366.03
Year 11			1,093,362	1,034,215	1,034,214.13
Year 12			1,122,502	1,061,779	1,061,777.78
Year 13			1,152,418	1,090,077	1,090,076.06
Year 14			1,183,132	1,119,130	1,119,128.64
Year 15			1,214,665	1,148,956	1,148,955.31
Year 16			1,247,039	1,179,578	1,179,595.36
Total Post-Acceptance			16,501,128	16,608,483	16,604,584.04
				Total Guaranteed Cost Savings (b-c)	Total Contractor Payments (c+f)
Total Implementation Period & Post-Acceptance				16,888,721	16,114,823.03

Footnotes/Comments:

J-7

This slide shows Schedule TO-1, Guaranteed Cost Savings and Contractor Payments. This example is filled in with information from our case study project.

The first line below the notes (columns a, b, and c) is where the ESCO would enter any savings and payments for the implementation period, and this is where one-time payments are entered. The lines below, for columns d, e, and f, show the estimated annual cost savings, the guaranteed cost savings, and the annual contractor payments.

Notice that the estimated savings amount is greater than the guaranteed savings. Most ESCOs guarantee about 95% of the estimated savings, which gives some room in complying with the requirement that the guaranteed savings must exceed contractor payments. The contractor payments are one dollar less than the guaranteed savings in each year on this example schedule (which is common).

See full-size TO schedules on following pages.

Schedule Date: _____

SCHEDULE TO-1 (Preliminary Assessment – PA)			
PROPOSED GUARANTEED COST SAVINGS AND CONTRACTOR PAYMENTS			
IMPORTANT INFORMATION			
(1) This schedule is not to be altered or changed in any way. Please note any clarifications in the comments/explanations area below. (2) [Reserved] (3) The guaranteed annual cost savings are based on the general description of M&V plan proposed for the project. (4) The total of annual contractor payments represents the TO price and should be supported by information submitted. (5) If applicable, prior to the post-acceptance performance period, implementation period allowable payments and energy savings are one-time amounts only. (6) The proposed guaranteed cost savings during the implementation period and post-acceptance performance period must exceed the contractor payments. (7) If applicable, submit escalation rates applied to initial estimated annual cost savings in column (a) as follows: a) energy rates: ____% per year (specify for each energy type); b) energy-related O&M savings (including water and sewer): ____% per year. (8) If selected, the contractor shall complete the installation of all proposed ECMs not later than ____ months after task award.			
Task Order No.:	Contractor Name:	Project Site:	
	(a) Estimated Cost Savings (\$)	(b) Proposed Guaranteed Cost Savings (\$)	(c) Contractor Payments (\$)
Implementation Period			
	(d) Estimated Annual Cost Savings (\$)	(e) Proposed Guaranteed Annual Cost Savings (\$)	(f) Annual Contractor Payments (\$)
Post-Acceptance Performance Period Year			
One			
Two			
Three			
Four			
Five			
Six			
Seven			
Eight			
Nine			
Ten			
Eleven			
Twelve			
Seventeen			
Eighteen			
Nineteen			
Twenty			
Twenty-one			
Twenty-two			
Twenty-three			
Twenty-four			
Total Post Acceptance:	\$	\$	\$
		Total Guaranteed Cost Savings (b+e)	Total Contractor Payments (c+f)
Total Implementation Period & Post Acceptance:			

Explanations/Comments:

SCHEDULE TO-1 (final)
GUARANTEED COST SAVINGS AND CONTRACTOR PAYMENTS

IMPORTANT INFORMATION

- (1) This schedule is not to be altered or changed in any way. Please note any clarifications in the comments/explanations area below.
- (2) The first year post-acceptance performance period estimated annual cost savings reflect technical proposal and engineering estimates as presented in TO-4.
- (3) The guaranteed annual cost savings are based on the general description of M&V plan proposed for the project.
- (4) The total of contractor payments (columns c and f) represents the TO price and should be supported by information submitted in and provided with Schedules TO-2 and TO-3.
- (5) If applicable, prior to post-acceptance performance period, implementation period allowable payments and energy savings are one-time amounts only.
- (6) If applicable, provide a separate table showing proposed energy rates (i.e., \$/kWh, \$/kW, \$/MBtu) for each post-acceptance performance period year, derived using the National Institute of Standards and Technology Handbook 135 and Annual Supplement or other appropriate methods. Also, submit escalation rates applied to energy-related O&M savings (including water and sewer): ____% per year.
- (7) The proposed guaranteed cost savings during the implementation period and post-acceptance performance period must exceed the contractor payments
- (8) [Reserved] (9) [Reserved]
- (10) If selected, the contractor shall complete the installation of all proposed ECMs not later than _____ months after TO award.

Task Order No.:	Contractor Name:	Project Site:	
	(a) Estimated Cost Savings (\$)	(b) Guaranteed Cost Savings (\$)	(c) Contractor Payment (\$)
Implementation Period	275,122	260,239	260,238.99
	(d) Estimated Annual Cost Savings (\$)	(e) Guaranteed Annual Cost Savings (\$)	(f) Annual Contractor Payments (\$)
Post-Acceptance Performance Period Year			
One	840,489	795,022	750,021.32
Two	862,890	816,211	816,210.07
Three	885,888	837,965	837,963.53
Four	909,498	860,298	860,296.76
Five	933,738	883,226	883,225.21
Six	958,623	906,766	906,764.75
Seven	984,172	930,933	930,931.65
Eight	1,010,402	955,744	955,742.64
Nine	1,037,331	981,216	981,214.90
Ten	1,064,978	1,007,367	1,007,366.03
Eleven	1,093,362	1,034,215	1,034,214.13
Twelve	1,122,502	1,061,779	1,061,777.78
Thirteen	1,152,418	1,090,077	1,090,076.06
Fourteen	1,183,132	1,119,130	1,119,128.54
Fifteen	1,214,665	1,148,956	1,148,955.31
Sixteen	1,274,038	1,179,578	470,695.36
Total Post Acceptance:	16,501,128	15,608,483	14,854,584.04
		Total Guaranteed Cost Savings (b + e)	Total Contractor Payments (c + f)
Total Implementation Period & Post Acceptance		15,868,721	15,114,823.03

Explanations/Comments:

- (1) Savings shown on Schedule TO-4 are escalated once to derive Year 1 savings.
- (2) Year 1 Guaranteed Savings includes \$45,000 intended for ESPC Project Facilitation

**SCHEDULE TO-2
IMPLEMENTATION PRICE BY ENERGY CONSERVATION MEASURE**

IMPORTANT INFORMATION:

- 1) This schedule is not to be altered or changed in any way. Please note any clarifications in the comments/explanations area below.
- 2) Implementation expense shall include only direct costs for each ECM and no post-acceptance performance period expenses. Indirect expenses and profit will be applied to the sum of direct expenses for all ECMs and project development to calculate total implementation price (d) for the project.
- 3) Contractor shall attach adequate supporting information detailing total implementation expenses.
- 4) Contractor shall propose bonded amount representing the basis of establishing performance and payment bonds per Section H of the contract, as required.
- 5) Attached supporting information shall be presented to identify portions of ECM or project expenses included in proposed bonded amount.
- 6) Proposed bonded amount is assumed to include indirect expenses and profit applied to implementation expenses above, unless otherwise specified by contractor.
- 7) For the following ECMs, enter the *total installed capacity of new equipment* in the units specified (e.g., chillers-150); chillers and packaged units in tons, VFDs in hp, boilers and furnaces in input Btu/hr, BAS/EMCS in number of points, transformers in kVA, generators in kW. For lighting ECMs, specify baseline kW treated.
- 8) M&V expense shall not include any performance-period expenses.

Project Site: Fort Raup

Task Order No.:000-xxx-000

Contractor Name:

Tech Category (TC)	ECM No.	Equipment Description — Title	ECM Size	M&V Expense	Implementation Expense		(c) Profit \$	(d) Implementation Price: Totals (a)+(b)+(c) = (d)
					(a) Direct	(b) Indirect		
n/a	n/a	Project Development	n/a	\$	\$456,468			
TC.3	3.1	Energy management control system improvements	32 bldgs, 706,330 sq ft, 3761 pts	79,844	1,197,835			
TC.5	5.1	Lighting improvements	29,439 kW/yr, 1,450,000 sf	21,996	1,917,663			
TC.13	13.1	Domestic water conservation	59.4 mill gal/yr, 2,855,000sf	4,663	819,311			
TC.13	13.5	Induced draft fan bearings – cooling water flow control	10/3 million gal/yr	1,000	2,384			
TC.13	13.8	Leak repairs	2.5 million gall/yr	1,000	13,906			
TC.13	13.9	Recirculation of wash rack sediment basin water	7 million gall/yr	1,000	21,917			
TC.13	13.10	Kitchen water conservation	6.8 million gall/yr	1,000	16,687			
					\$			
					\$			
					\$			
TOTALS				110,503	4,895,713	708,211	650,000	\$ 6,364,427
Bonded Amount (\$)								

Explanations/Comments:

SCHEDULE TO-3 — POST-ACCEPTANCE PERFORMANCE PERIOD CASH FLOW (page 1)

IMPORTANT INFORMATION: This schedule is not to be altered or changed in any way.

Project Site: _____ **Task Order No:** _____ **Contractor Name:** _____

Project Capitalization		Applicable Financial Index: US Treasury Securities	Issue Date: 2/21/2010
Total Implementation Price (from TO-2 Total)	\$6,364,427	Term (Years): 16 years	Source: Hannon Armstrong
Plus Financing Procurement Price (\$)	\$405,426	Index Rate: 4.60%	Effective Through: 2/27/2010
Less Implementation Period Payments (from TO-1 (final (c)) <i>(If proposed, must be fully documented)</i>)	\$260,239	Added Premium (adjusted for tax incentives): 1.10%	
Total Amount Financed (Principal)	\$6,509,613	Project Interest Rate: 5.70%	

Term	1	2	3	4	5	6
Annual Cash Flow (Post-Acceptance Performance Period)						
Debt Service						
Principal Repayment (\$)	107,743	197,733	226,043	256,488	289,206	324,342
Less incentives (i.e., REC, White Tag, etc.)						
Net principal repayment before interest	107,743	197,733	226,043	256,488	289,206	324,342
Interest (\$)	368,262	359,794	347,791	334,119	318,654	301,260
Total Debt Service (a)	476,005	557,526	573,835	590,608	607,859	625,602
Post-Acceptance Performance Period Expenses	1,000	1,021	1,043	1,064	1,087	1,110
Management/Administration	10,801	11,028	11,261	11,498	11,740	11,987
Operation						
Maintenance	62,786	64,108	65,457	66,835	68,242	69,678
Repair and Replacement	94,417	96,404	98,434	100,506	102,621	104,782
Measurement and Verification	39,584	24,432	24,946	25,471	26,008	26,555
Permits and Licenses						
Insurance						
Property Taxes						
Other – Describe and Explain						
Other – Describe and Explain						
SUBTOTAL Before Application of Indirect Rates	207,588	195,972	200,098	204,310	208,610	213,002
Indirect Cost Rate (%)	32%	32%	32%	32%	32%	32%
Indirect Cost Applied (\$)	66,428	62,711	64,031	65,379	66,755	68,161
SUBTOTAL Post-Acceptance Performance Period Exp						
Post-Acceptance Performance Period Profit (%)						
Post-Acceptance Performance Period Profit (\$)						
Total Post-Acceptance Performance Period Expenses (b)	274,016	258,684	264,129	269,689	275,366	281,162
TOTAL - ANNUAL CONTRACTOR PAYMENTS (a)+(b)	750,021	816,210	837,964	860,297	883,225	906,765

Term	7	8	9	10	11	12
Annual Cash Flow (Post-Acceptance Performance Period)						
Debt Service						
Principal Repayment (\$)	362,053	402,504	445,870	492,337	542,102	595,375
Less incentives (i.e., REC, White Tag, etc.)						
Net principal repayment before interest	362,053	402,504	445,870	492,337	542,102	595,375
Interest (\$)	281,798	260,115	236,051	209,435	180,085	147,807
Total Debt Service (a)	643,851	662,619	681,921	701,772	722,187	743,183
Post-Acceptance Performance Period Expenses	1,133	1,157	1,181	1,206	1,232	1,258
Management/Administration	12,239	12,497	12,760	13,028	13,303	13m583
Operation						
Maintenance	71,145	72,643	74,172	75,733	77,327	78,955
Repair and Replacement	106,987	109,239	111,539	113,887	116,284	118,732
Measurement and Verification	27,114	27,685	28,268	28,863	29,470	30,090
Permits and Licenses						
Insurance						
Property Taxes						
Other – Describe and Explain						
Other – Describe and Explain						
SUBTOTAL Before Application of Indirect Rates	217,485	222,063	226,738	231,511	236,384	241,360
Indirect Cost Rate (%)	32%	32%	32%	32%	32%	32%
Indirect Cost Applied (\$)	69,595	71,060	72,556	74,038	75,643	77,235
SUBTOTAL Post-Acceptance Performance Period Exp						
Post-Acceptance Performance Period Profit (%)						
Post-Acceptance Performance Period Profit (\$)						
Total Post-Acceptance Performance Period Expenses (b)	287,081	293,124	299,294	305,594	312,027	318,595
TOTAL - ANNUAL CONTRACTOR PAYMENTS (a)+(b)	930,932	955,743	981,215	1,007,366	1,034,214	1,061,778

Term	13	14	15	16	Totals
Annual Cash Flow (Post-Acceptance Performance Period)					
Debt Service					
Principal Repayment (\$)	652,377	713,344	778,525	123,569	6,769,852
Less incentives (i.e., REC, White Tag, etc.)					
Net principal repayment before interest					
Interest (\$)	112,397	73,635	31,289	847	3,563,339
Total Debt Service (a)	764,775	786,979	809,814	124,416	10,333,191
Post-Acceptance Performance Period Expenses	1,284	1,311	1,339	1,367	
Management/Administration	13,868	14,160	14,458	14,763	202,972
Operation					
Maintenance	80,617	82,314	84,047	85,816	1,179,875
Repair and Replacement	121,231	123,783	126,389	129,049	2,318,224
Measurement and Verification	30,724	31,371	32,031	32,705	465,317
Permits and Licenses					
Insurance					
Property Taxes					
Other – Describe and Explain					
Other – Describe and Explain					
SUBTOTAL Before Application of Indirect Rates	246,441	251,628	256,925	262,333	3,622,449
Indirect Cost Rate (%)	32%	32%	32%	32%	
Indirect Cost Applied (\$)	78,861	80,521	82,216	83,947	1,159,184
SUBTOTAL Post-Acceptance Performance Period Exp					
Post-Acceptance Performance Period Profit (%)					
Post-Acceptance Performance Period Profit (\$)					
Total Post-Acceptance Performance Period Expenses (b)	325,302	332,149	339,141	346,280	4,781,632
TOTAL - ANNUAL CONTRACTOR PAYMENTS (a)+(b)	1,090,076	1,119,129	1,148,955	470,695	15,114,823.03

SCHEDULE TO-4

Task Order Performance Period First Year Estimated Annual Cost Savings, by Energy Conservation Measure and Technology Category

IMPORTANT INFORMATION:

- 1) Project Square Footage (in 1000 SF) - Include only building square footage affected by installed ECMs in project.
- 2) For column (a) insert estimated energy baseline by ECM and total project in MBtu based on IGA, and proposal data.
- 3) For column (c1), annual electric demand savings (kW/yr) is the sum of the monthly demand savings
- 4) Energy conversion factors for MBtu: MBtu=10⁶ Btu; Electricity — 0.003413 MBtu/kWh; Natural Gas — 0.1 MBtu/therm ; #2 Oil — 0.128 MBtu/gal.
- 5) Specify "Other" energy savings in (e)(1) and (e)(2) as applicable. Include energy type ____; energy units ____; and MBtu conversion factor ____ MBtu/ ____ (unit)
- 6) This schedule is not to be altered or adapted in any way. Please note any clarifications in the comments/explanations area below.

Project Site:		Task Order#:				Contractor Name:				Project Square Footage (KSF):								
TC No. Att J3	ECM No.	a. ECM energy baseline (MBtu/yr)	b1. Electric energy savings (kWh/yr)	b2. Electric energy savings (\$/yr)	c1. Electric demand savings (kW/yr)	c2. Electric demand savings (\$/yr)	d1. Natural gas savings (MBtu/yr)	d2. Natural gas savings (\$/yr)	e1. Other savings (MBtu/yr)	e2. Other savings (\$/yr)	f. b1+d1+e1 Total energy savings (MBtu/yr)	g.=b2+c2+d2 +e2 Total energy cost savings (\$/yr)	h. Other energy-related and O&M cost savings (\$/yr)	i. Water savings (1000 gal/yr)	j. Water savings (\$/yr)	k=g+h+j Estimated annual cost savings (\$/yr)	l. Implementation price (\$)	m=l/k Simple Payback (yrs.)
n/a	n/a																\$602,538	
TC.3	3.1	84,804	1,621,687	\$61,348			6,981	\$45,864	15,692	\$41,89	28,209	\$149,110	204,364			\$353,474	\$1,581,142	4.5
TC.5	5.1	30,901	5,203,992	\$261,403	14,907	\$28,697	(805)	\$(4,476)			16,691	\$285,624	20,827			\$306,452	\$2,531,316	8.3
TC.1	13.1	28,670	835,107	\$45,071			2,252	\$15,186	2,005	\$5,353	7,108	\$65,610		26,265	\$55,405	\$121,015	\$1,081,491	8.9
TC.1	13.5													5,451	\$11,012	\$11,012	\$3,147	0.3
TC.1	13.8	322							322	\$859	322	\$859		2,533	\$5,117	\$5,977	\$18,356	3.1
TC.1	13.9		(373)	\$(14)							(1)	\$(14)		6,992	\$14,124	\$14,110	\$28,930	2.1
TC.1	13.10	2,429							474	\$1,266	474	\$1,266		2,657	\$5,366	\$6,632	\$22,027	3.3
EMS [ESCO] direct cost (less proposal development energy surveys)																	\$593,394	
TOTALS		147,126	7,660,413	\$367,808	14,907	\$28,697	8,427	\$56,574	18,493	49,376	53,073	\$436,845	\$225,191	43,898	\$91,024	753,060	\$6,364,427	7.77

Explanations/Comments:

For ECM 3.1, energy-related O&M savings are from avoided existing O&M subcontract and equal to proposed O&M costs for preventive maintenance and repair.
 For ECM 5.1, energy-related O&M savings and lighting materials (only) savings.

SCHEDULE TO-5		
ANNUAL CANCELLATION CEILING SCHEDULE		
IMPORTANT INFORMATION:		
(1) Cancellation Ceilings for each time period specified below establish the maximum termination liability for that time period, and includes the remaining unamortized principal on total amount financed for each time period specified below plus any prepayment charges. Actual total termination costs will be negotiated.		
(2) The contractor may attach a monthly Financing Termination Liability Schedule.		
(3) In the event of TO cancellation or termination for convenience, FAR 52.217-2 or 52.249.2 will apply.		
Project Site:	Task Order No:	Contractor Name:
Fort Raup		EMS

Time Period	Cancellation Ceiling
Installation Acceptance	6,883,854
End of Year One	6,755,376
End of Year Two	6,531,010
End of Year Three	6,276,233
End of Year Four	5,988,823
End of Year Five	5,666,415
End of Year Six	5,306,497
End of Year Seven	4,906,399
End of Year Eight	4,463,286
End of Year Nine	3,974,147
End of Year Ten	3,435,783
End of Year Eleven	2,844,800
End of Year Twelve	2,197,592
End of Year Thirteen	1,490,335
End of Year Fourteen	718,967
End of Year Fifteen	
End of Year Sixteen	
End of Year Seventeen	
End of Year Eighteen	
End of Year Nineteen	
End of Year Twenty	
End of Year Twenty-one	
End of Year Twenty-two	
End of Year Twenty-three	
End of Year Twenty-four	
End of Year Twenty-five	

TO-2 shows total direct and indirect costs and profit by ECM

**SCHEDULE TO-2
IMPLEMENTATION PRICE BY ENERGY CONSERVATION MEASURE**

IMPORTANT INFORMATION:
 1) This schedule is not to be altered or changed in any way. Please note any clarifications in the comments explanation area below.
 2) Implementation expenses shall include every direct cost for each ECM and no pre-acceptance performance period expenses. Indirect expenses and profit will be applied to the sum of direct expenses for all ECMs and project development to calculate total implementation price for the project.
 3) Contractor shall attach adequate supporting information detailing total implementation expenses.
 4) Contractor shall propose bonded amount representing the basis of establishing performance and payment bonds per Section H of the contract, as required.
 5) Attached supporting information shall be presented to identify portions of ECMs or project expenses included in proposed bonded amount.
 6) Proposed bonded amounts assumed to include indirect expenses and profit applied to implementation expenses above, unless otherwise specified by contractor.
 7) For the following ECMs, enter the total installed capacity of new equipment in the units specified (e.g., chiller-100), chiller and packaged units in tons, VECs in hp, boilers and furnaces in input Btu's, BA in Btu/h, number of seats, washers in c/w, generators in kW, For Lighting ECMs, specify ballast kW treated.
 8) M&V expenses shall not include any performance-period expenses.

Task Category (TC)	ECM No.	Equipment Description – Title	ECM Size	MBV Expense	Implementation Expense (a) Direct	(c) Profit % Indirect	(d) Implementation Price Totals (a)+(b)+(c)+(d)	
n/a	n/a	Project Development	n/a	\$	\$455,455			
TC-3	3.1	Energy management control system improvements	32 (000s) 705,330 BA \$		79,844	1,197,835		
TC-5	5.1	Lighting improvements	29,439 kWh/yr, 1,450,000 ft		21,958	1,917,663		
TC-13	13.1	Domestic water conservation	59.4 million gal/yr, 2,855,000 gal		4,663	819,311		
TC-13	13.5	Industrial draft fan bearings-cooling water flow control	10.0 million gal/yr	1,000		2,384		
TC-13	13.8	Leak repairs	2.5 million gal/yr	1,000		13,008		
TC-13	13.9	Recirculation of wash rack sediment basin water	7 million gal/yr	1,000		21,917		
TC-13	13.10	Kitchen water conservation	6.8 million gal/yr	1,000		16,687		
				\$	\$	\$		
				\$	\$	\$		
TOTALS				110,503	4,895,713	708,211	650,000	\$ 6,364,427
Bonded Amount (\$)								
Explanations/Comments:								

TO-2 shows ECM implementation costs. The total direct costs are listed for each ECM, and indirect costs and profit is calculated on the total direct ECM costs. The total implementation price at the bottom of this schedule is carried forward to TO-3.

The term of the contract is determined by the cash flow needed to pay for the investment shown on TO-2.

TO-3 Post-Acceptance Performance Period Cash Flow

SCHEDULE TO-3 — POST-ACCEPTANCE PERFORMANCE PERIOD CASH FLOW (page 1)

IMPORTANT INFORMATION: This schedule is not to be altered or changed in any way.

Project Site: _____ Task Order No.: _____ Contractor Name: _____

Project Completion: _____ Approximate Financial Dates: 1/28 Treasury Securities Issue Date: 2/1/2010
 Total Implementation Price (from TO-2 Total): \$6,364,427 From: Treasury Securities Issue: Business Announcements
 Pre-Implementation Period Price (%): \$495,455 Index Rate: 4.60% Effective Through: 2/1/2010
 Less Implementation Period Payments (from TO-1 (Sum of (C) or contract modification documents): \$380,295 Added Premium (Adjusted for tax benefits): 1.10%
 Total Amount Financed (Present): \$6,939,615 Interest Interest Rate: 5.10%

Item	1	2	3	4	5	6
Annual Cash Flow (Post-Acceptance Performance Period)						
Debt Service						
Principal Payment (%)	107,742	197,759	228,045	268,485	288,208	334,342
Less Accretion (i.e., BEC, (Show "0" if nil))						
Unleveraged cash flow before taxes	107,742	197,759	228,045	268,485	288,208	334,342
Interest (%)	389,262	389,794	347,791	336,116	319,894	301,289
	418,004	487,554	473,836	469,956	467,898	428,632
Total Debt Service (a)	1,000	1,021	1,048	1,064	1,087	1,110
Post-Acceptance Performance Period Expenses						
Measurement Administration	10,891	11,058	11,281	11,496	11,748	11,987
Operations	62,768	64,104	65,487	66,928	68,342	69,878
Renovate and Repaints	44,417	45,424	46,444	47,484	48,550	49,652
Measurement and Audits	39,864	41,442	43,048	44,677	46,327	48,000
Permit and Licenses						
Insurance						
Process Taxes						
Other – Describe and Explain						
Other – Describe and Explain						
BEFORE Tax Before Application of Indirect Rates	207,588	192,677	200,268	204,919	208,810	213,002
Index Cost Rate (%)	324	324	324	324	324	324
Index Cost Applied (%)	68,420	62,711	64,021	65,379	66,769	68,161
BEFORE Tax Post-Acceptance Performance Period Exp						
Post-Acceptance Performance Period Profit (%)						
Post-Acceptance Performance Period Profit (%)						
TOTAL - ANNUAL CONTRACT PAYMENTS (a+b)	780,024	818,274	837,864	860,207	883,222	906,769

Schedule TO-3 is a comprehensive summary of the project cash flow, showing all the financing rates and costs, and how much of your payments go to interest and principal. TO-3 also breaks down the details of performance-period-service costs. Notice that the implementation price from TO-2 is shown at the top left. In the same column it shows that the implementation price, plus the financing procurement price, less the implementation period payment (one-time payment) equals the amount financed.

In the top center and right columns is more financing information: the index rate, the financier's added premium, and other details.

The lower section of the schedule shows all project costs in your payments for each year in the columns going across the page, with the total payment for the year at the bottom. These annual totals should match the payment amounts in TO-1.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

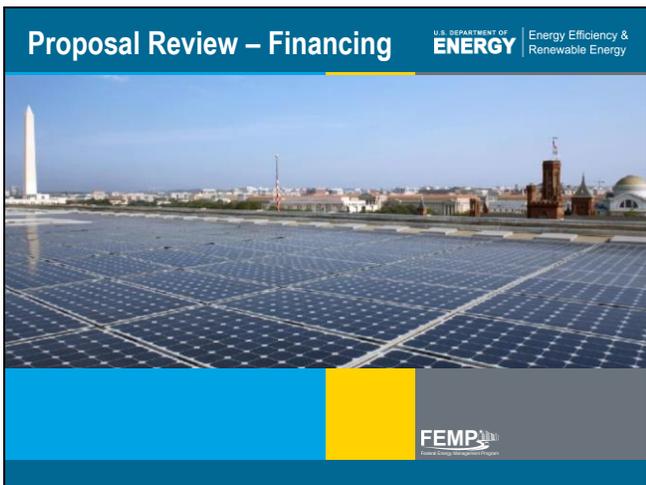
**Next: K
Proposal
Review –
Financing**



J-15

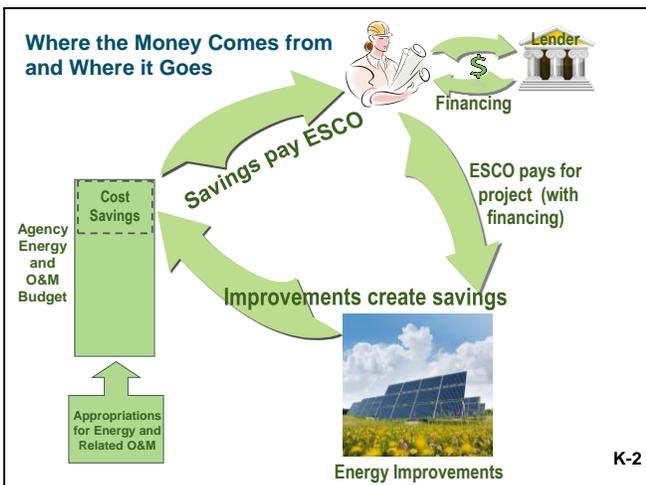
Federal Energy Management Program femp.energy.gov

K – Proposal Review – Financing



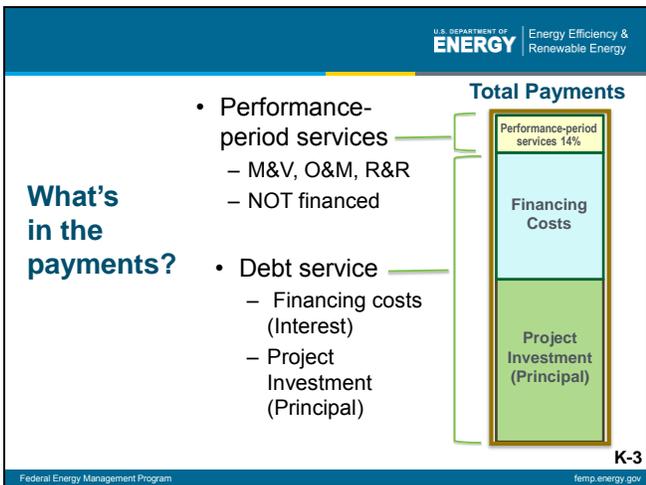
With ESPC no special capital line item appropriations are required. All that is required is the normal annually appropriated operating funds to energy and related O&M accounts. The basis for the public-private ESPC partnership is the ESCO offering to identify, develop, and implement projects with private-sector financing, and then the project creating enough cost savings to enable the government to repay the ESCO from these accounts over time.

The ESPC deal, or task order, that you sign shows a firm, fixed price and a schedule of payments for the term of the contract, and also shows the guaranteed cost savings, which are at least as much as the payments.



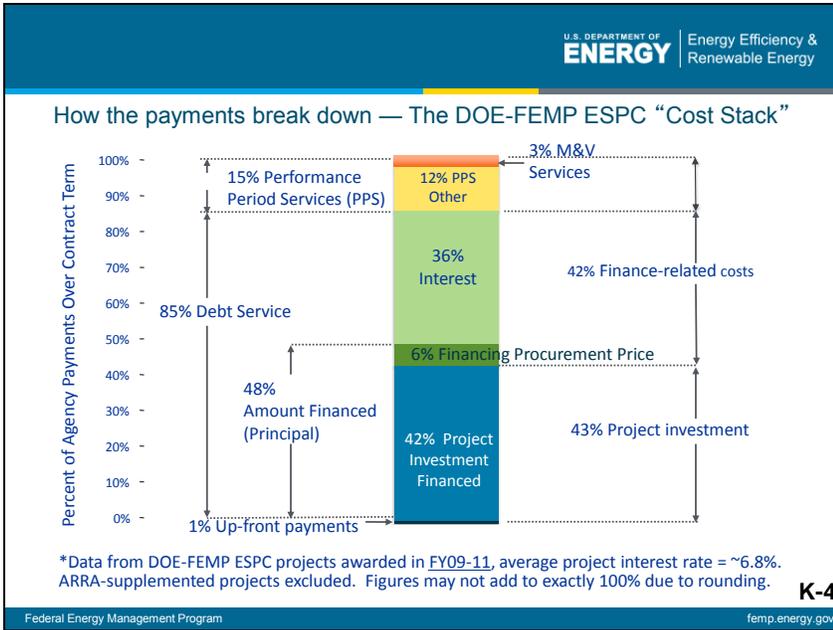
The ESCO (or energy service company) acquires financing and uses that money to install the energy conservation measures. (Note that the financing agreement is between the ESCO and the financier, NOT the agency and the financier.) Facility improvements generate the guaranteed cost savings. Since agency costs are lower, the money is available to make the ESPC payments over the term of the contract.

The money to pay the ESCO comes from your normal appropriations for utility bills and related operations & maintenance, and the cost savings created by the ESPC. That’s why we say that ESPCs are “budget-neutral.”



There are two major components in government payments. Debt service (principal and interest) repays the financier for the up-front money used by the ESCO to develop and implement the project. The other part of the payments is for performance-period services assigned to the ESCO in the task order, which can include M&V, O&M, R&R, and training.

The cost of performance-period services, then, is not financed.



This slide breaks down the cost elements by percentage of total payments over term. The average term is about 18 years, and typically that ranges from 16 to 21 years.

There major breakdown is:

- 43% project investment: the cost of the equipment being installed at the site (the bottom two bars).
- 42% financing-related costs: interest payments and financing procurement price.
- 15% performance period services: O&M, R&R, M&V.

The slide breaks these categories down even further, and when you analyze your own project you can compare it with these averages.

Amount Financed =

- + ECM project development expense
- + indirects and profit
- + ECM design/construction expense
- + indirects and profit
- + Financing procurement price (FPP)
- *Minus* any one-time payments (usually before project acceptance)

Federal Energy Management Program | femp.energy.gov

The ESCO is not just financing the cost of the ECMs. There’s also the cost of the project development (surveys, studies, design, etc.) plus the ESCO’s indirect costs and profit, as well as the financing procurement price.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Financing Procurement Price (FPP)

- Pass-through fee charged by financier
 - No profit for the ESCO
- Includes costs for:
 - Effort to arrange financing
 - Payment and performance bonds
 - Hedges to lock rates in advance of financial closing (hedges are not recommended)
- Biggest part of FPP is *capitalized construction-period interest*

K-6

Federal Energy Management Program femp.energy.gov

For projects awarded over the last two years financing procurement price has averaged about 6% of the total payments over term. The financing procurement price includes the cost of procuring the financing and the cost of payment and performance bonds, but the majority is capitalized construction period interest.

The payment and performance bonds serve as a form of insurance during the construction period, providing the financial resources to pay suppliers and subcontractors and potentially a new prime contractor to finish installing the project if the ESCO has financial or other difficulties and is unable to do so. The ESCO effort to arrange financing, fees of financiers retained as placement agents, closing costs, and other fees may also be included. It is important to get an itemization of FPP and to independently verify the large cost components when reviewing a financing offer.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

What is capitalized construction-period interest?

- The total financed amount is deposited into a escrow account at beginning of construction
 - Generally administered by trustee
 - ESCO takes draw-downs
 - Account yields interest
 - ESCO pays interest on entire financed amount to the financier
- The difference between the interest earned and interest paid is the *capitalized construction-period interest*

K-7

Federal Energy Management Program femp.energy.gov

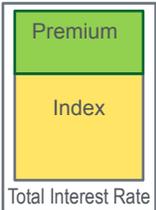
After the ESPC task order is signed, the financing is made available to the ESCO to fund project design and construction, but that also means that interest begins to accrue. Remember that the money is loaned to the ESCO, but the agency's payments to the ESCO don't begin until the project is finished and accepted, and construction typically takes one and a half to two years.

We've found that generally the least expensive way to structure the financing is for the ESCO to deposit the proceeds from the financing into an interest-bearing escrow account during construction. The ESCO pays the interest on the entire financed amount during construction, but the escrow account yields some interest. The difference between those amounts is the total interest on the loan for the construction period, which is "capitalized." That is, the ESCO "overborrows" this amount, on top of what project implementation will cost, and it's included in the principal to be repaid over the term of the contract.

U.S. DEPARTMENT OF
ENERGY Energy Efficiency & Renewable Energy

Components of the Interest Rate

- Index interest rate — usually largest component
 - Represents the prevailing cost of money in the financial markets
 - Changes day to day
 - Any standard index can be used (e.g., like-term U.S. Treasury Securities)
- Web sources for rates
 - www.bloomberg.com
 - www.federalreserve.gov/releases/h15/current



K-8

Federal Energy Management Program femp.energy.gov

Your project will have a certain interest rate, which has two parts: the INDEX RATE, and the PREMIUM.

The INDEX RATE is the largest component. It represents the cost of money, and it changes every day according to the financial markets.

Typically, the index rate approximates the return on a 20-year U.S. Treasury security. Another way of thinking of this is that it's the RISK-FREE RATE. The financier could get this rate of return at no risk by purchasing Treasury securities.

U.S. DEPARTMENT OF
ENERGY Energy Efficiency & Renewable Energy

The Premium

- Premium — Basis points added to index rate (1% = 100 basis points)
- Premium covers
 - Lender's costs (legal fees, administration, etc.)
 - Lender's perception of risk



K-9

Federal Energy Management Program femp.energy.gov

A premium is added to the index interest rate to cover the lender's transaction costs, such as legal fees, administration, etc. The premium is usually measured in basis points — 100 basis point equals 1%. Most ESPC loan premiums have been in the range of 100 to 250 basis points.

The premium also reflects any special risk in the project perceived by the lender.

U.S. DEPARTMENT OF
ENERGY Energy Efficiency & Renewable Energy

Competition in ESPC Financing



- FEMP-DOE ESPC ESCOs are required to solicit competitive financing offers
- Process and templates are defined in the contract
- Financing costs declined significantly with competition
- Selection of financing is still the ESCO's responsibility

K-10

Federal Energy Management Program femp.energy.gov

Competition in financing has made a big difference in the ESPC program. Since reforms were incorporated into the contracts in 2004, the ESCOs have been required to solicit competitive bids for their financing. The premiums dropped quite a bit and reduced financing costs considerably.

While the selection of the financier is the responsibility of the ESCO, the competition requirement was intended to bring transparency to the process to ensure that the ESPC represents best value to the government.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Competitive Financing Process

- ESCO prepares Investor’s Deal Summary (IDS) and sends it to financiers to solicit offers
 - IDS establishes a common basis for solicitations
- Required content
 - All financial info
 - Risk, Responsibility, and Performance Matrix
 - Key target dates
 - M&V info
 - Financiers sometimes consider non-Option-A ECMs to represent risk

K-11

Federal Energy Management Program | femp.energy.gov

The process that was worked out to make sure that agencies would get competitive financing for their ESPC projects is defined in the master DOE ESPC IDIQ contracts.

The ESCO prepares an Investor’s Deal Summary (IDS) and sends it to financiers to solicit offers. The required content of the IDS makes sure that all the offers are based on the same parameters.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

IDS and SFO Ensure that Offers are Directly Comparable



- Financiers make offers using Standard Financing Offer (SFO)
- Required contents:
 - Narrative description of financing package
 - Itemization of total amount financed
 - Period of time that offer will be honored
 - Other terms

K-12

Federal Energy Management Program | femp.energy.gov

The financiers use the Standard Financing Offer (SFO), with all of its required content, to submit their offers so that they’re all comparable and the ESCOs have the information they need to select the best offer.

The templates for the Investor’s Deal Summary and the Standard Financing Offer are IDIQ attachments J-11 and J-12.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

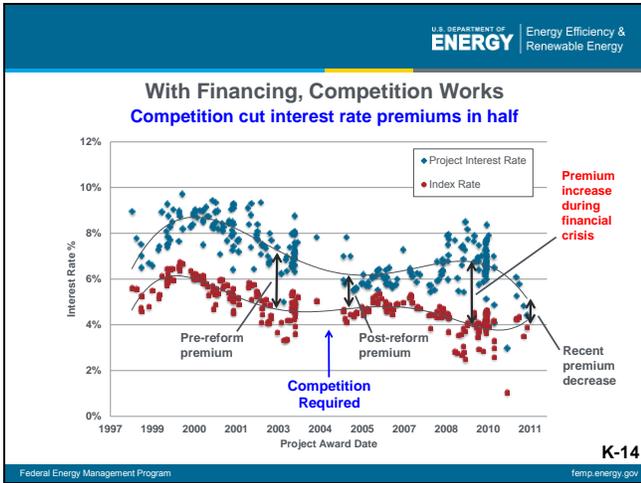
Selection and Certification

- ESCO selects financing based on best value to the government
- ESPC provides a certified selection memo documenting process and rationale for selection
- Final proposal (and final TO schedules) are based on selected offer
- ESCO sends IDS and SFO for selected offer along with Certified Selection Memo to agency CO

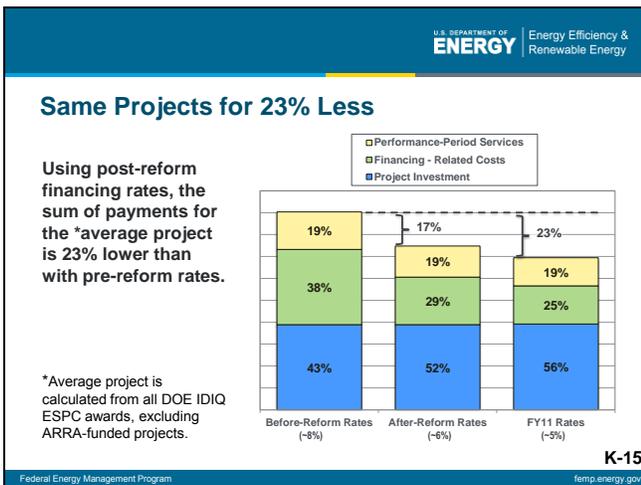
K-13

Federal Energy Management Program | femp.energy.gov

The ESCO reviews the financing offers and selects the one that offers the best value to the government. The financing selection is documented by a certified selection memorandum in the final proposal.



The effect of the financing reforms can be seen in the middle of the chart (“competition required”). The blue dots are the index rates for FEMP-DOE ESPC projects (here we use like-term Treasury securities, which is the yield of a theoretical T-bill with term equal to the project term). The red dots represent the total interest rates for the projects. The premiums are represented by the difference between the two. Premiums dropped from 240 to about 120, on average, after competition was required. In the years after that, you can also see the effect of the financial crisis from around 2008 to 2010, when interest rates rose sharply. In 2012, interest rates were at all-time lows.



Lower interest rates have a compounding effect on overall total payments. Total payments for projects before competition in financing was required are represented in the column on the left, when interest rates averaged around 8%. After competition was required, interest rates averaged around 6%, and that meant that total payments for an average project dropped by 17%. In FY 2011, interest rates had averaged about 5%, and total payments were 23% lower than before the financing reforms.

Lender’s Perception of Risk

- Consider: The financing deal is between the financier and the ESCO
- Lender's perception of risk is influenced by:
 - ESCO's credit rating
 - Agencies' payment history (late payments, prepayments)
 - ESCO's track record (past performance)
 - Technical risk of the project
 - Level of M&V, complexity, etc.

K-16

Federal Energy Management Program

femp.energy.gov

The lender evaluates the risk of financing an ESPC project based on the potential for the ESCO and the agency to carry out their obligations under the contract and the potential for anything to interfere with the government’s obligation or willingness to pay the ESCO. This actually happens at a very high level, but the lender is most interested in the ESCO’s credit rating and track record.

Technical risk can be a factor if the ECMs are unusually complex or new.

Also the more measurement in the measurement & verification plan, the more risk the lender sees that the ESCO will not prove that the guarantee has been met.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

How can you minimize financing costs?
Borrow less and pay it off sooner.

- Incentives and Rebates – Public benefit program EE and RE incentives; utility rebates
 - Agencies are “authorized and encouraged to participate” in these programs (EPACT-92 and other)
 - ESCOs are required by IDIQ contract to pursue all available incentives

FEMP’s Energy Incentive Program has info on incentives available to agencies in each state:
FEMP → Project Funding → Energy Incentive Programs

K-17

Federal Energy Management Program | femr.energy.gov

The most important thing agencies can do to minimize financing costs is to explore opportunities to bring the financed amount down and to pay off the debt sooner. There are several ways to reduce the financed amount (the principal) at the beginning of the project term.

Utility rebates and incentive programs are available in many places, and your ESCO is required to research what’s available and take advantage of them.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Borrow Less: One-Time Payments
– Reduce the Financed Amount
– Reduce Financing Costs

- One-time savings from avoided expenditures
- Construction-period savings

Pay Off Sooner: Make Annual Payments at Beginning of Contract Year

- This is permitted because it satisfies the condition that savings must be greater than payments on an *annual* basis

K-18

Federal Energy Management Program | femr.energy.gov

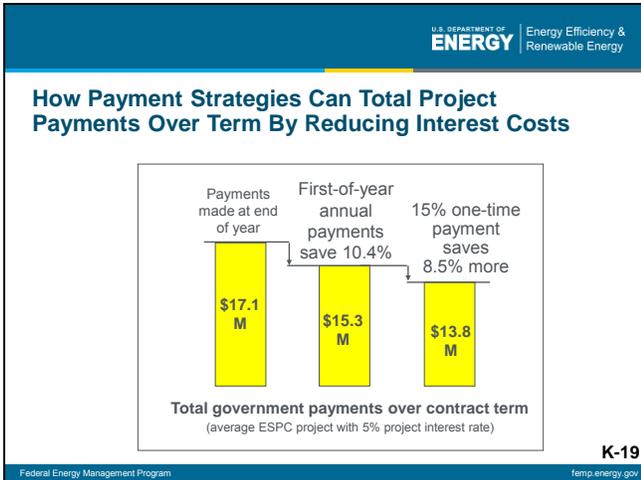
One-time payments at the beginning of the contract term to reduce the financed amount (the principal) are permitted in ESPCs.

EISA Section 432 reinforces the authorization for agencies to combine financing and appropriations in energy projects, as long as funds are “... paid only from funds appropriated or otherwise made available to the agency . . . for the payment of energy, water, or wastewater treatment expenses (and related operation and maintenance expenses).”

Funds that an agency site would have spent on, for example, a chiller replacement, may be applied to the project as a one-time payment on the ESPC, usually before the project is accepted, to reduce the financed amount and interest costs.

There are also opportunities in some projects to pay the ESCO for energy savings that accrue before project acceptance – for example, lighting ECMs are often the first ECMs to be completed, and they may generate savings for several months before project acceptance.

Also, making annual payments at the beginning of the project year instead of the end can significantly reduce interest costs.



This slide shows how much total costs for the average project, even with a low 5% interest rate, can be reduced. For this “average” project, total payments made at the end of each contract year would total \$17.1 million. However, just making those payments at the beginning of the year saves almost 10%, and making a one-time payment of 15% at the beginning of the contract term saves another 8.5%.

-
- FEMP Advice on Financing Review**
- Competition is a good thing. Make sure your ESCO is soliciting multiple offers.
 - Wade through the details of the financial schedules (especially TO-3) and SFO and understand the components of the offer.
 - Require justification for any differences between financier’s offer to ESCO and ESCO’s offer to government.
 - Check the calculation of construction-period interest
- K-20**

-
- Take advantage of FEMP’s services and experience**
- The FEMP ESPC team will review financing
 - Access to comparisons with other ESPC awards
 - Capability to analyze the financial schedules
 - Double-check the math
 - See that appropriate costs are entered where they should be
- K-21**

-
- Review**
- Are the costs for performance-period services financed, and must they be covered by savings?
 - What are the two components of the total interest rate?
 - Who are the parties to the financing deal?
 - What (in general terms) can agencies do to minimize financing costs?
- K-22**



Review of Proposal – Pricing




Review of Proposal —
Pricing

L-1



Pricing — Overview

- Agency is responsible for determining price reasonableness
- Pricing is summarized in financial schedules
 - TO-2, Implementation Price by Energy Conservation Measure, and
 - TO-3, Post-Acceptance Performance-Period Cash Flow
- ESCO should provide information supporting ECM and project pricing (as specified by agency in TO RFP requirements)

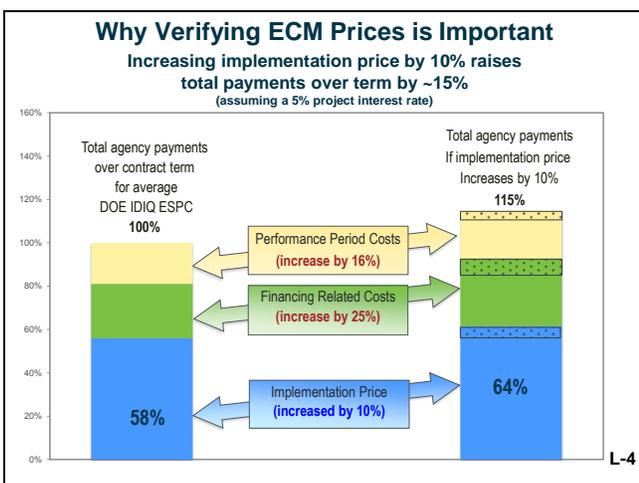
L-2



Contracting Officers....

- You must be as careful in your analyses of purchases under the ESPC as any other.
- Paying fair and reasonable prices is critical in ESPCs where procurement is financed over time.
- Next slide demonstrates the result of careful evaluation of your project costs.

L-3



It is especially important to get ECM pricing right when you're paying interest on your acquisition. The higher the ECM price, the more interest you pay.

Since the amount of cost savings available doesn't change, the only way the project can cash flow with the higher payments is to extend the term. This further increases interest costs and means the performance period services are happening for a longer period of time. This has a multiplier effect. Even with the low interest rates projects are getting today, raising ECM prices by 10% raises total payments over term by about 15%.

U.S. DEPARTMENT OF **ENERGY** Energy Efficiency & Renewable Energy

Regulatory Perspective on Price Reasonableness in ESPCs

- ESPC authorizing legislation stresses life-cycle cost-effectiveness, but does not exempt agencies from assuring price reasonableness
- DOE Rule, 10 CFR 436
 - Waives requirement for submission of certified cost data
 - States that offerors must nevertheless provide information requested by federal agencies
 - Did not specify how agencies are to assure price reasonableness

L-5

The federal ESPC regulations stress life-cycle cost-effectiveness, but this doesn't exempt agencies from making sure that they're getting reasonable prices on their projects. The DOE Rule that established regulations for ESPCs does waive the requirement for certified cost data, but agencies can and should still request from the ESCO all the information they need to determine whether prices are reasonable. The DOE Rule doesn't specify how price reasonableness of ESPCs should be determined, so we go back to the Federal Acquisition Regulations.

U.S. DEPARTMENT OF **ENERGY** Energy Efficiency & Renewable Energy

Federal Acquisition Regulations (FAR) Apply to Federal ESPCs:

- Subpart 15.4, "Contract Pricing"
- In case of conflicts, EAct or the DOE Final Rule take precedence
- There are no conflicts between FAR Subpart 15.4 and ESPC regulations regarding price reasonableness determination
- (More on Far guidance later)

L-6

The FAR does apply to ESPCs, specifically, Subpart 15.4 on contract pricing. We're going to talk more later about what the FAR says about price reasonableness.

U.S. DEPARTMENT OF **ENERGY** Energy Efficiency & Renewable Energy

Supporting Information on Pricing

- Agency specifies required level of detail in TO RFP
 - Project development costs
 - Implementation-period pricing
 - Performance-period expenses
- ESCO's subcontract pricing can be valuable information
 - Agencies have sometimes required information on competition of subcontracts

L-7

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

Overall Review Strategy

- Start with the TO schedules
- Look for reasonableness, consistency, and back-up documentation on
 - ECM implementation price
 - Performance-period expenses
- Make sure total price is complete and reflects appropriate implementation costs
- Make sure performance-period services are consistent with assignments per Risk, Responsibility, and Performance Matrix

L-8

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

ECM Pricing Review Strategy — Step 1

- Agency assesses quality and completeness of data provided by ESCO
 - with PF and FEMP ESPC team assistance

L-9

The first step in a pricing review is to assess the information provided. Do you have everything you need to assess price?

To analyze pricing, the ECMs must be clearly described in the proposal, including the QUANTITY to be installed. For example, if the project includes ground source heat pumps or chillers, you need to know HOW MANY are being installed, and what the TOTAL CAPACITY is. This information should be entered under “ECM Size” on schedule TO-2.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

ECM Pricing Review Strategy — Step 2 — FEMP Web Tools

- For cost-effective review, first use [ECM Price Benchmarks](#) (ORNL-FEMP database on prices of lighting, chillers, VFDs, GSHPs)
 - If within acceptable range, move on
 - If high/low, then flag for discussion with ESCO
- Next use [ECM Locator](#) to identify similar ECMs for comparison
 - If within acceptable range, move on
 - If high/low, then flag for discussion with ESCO

L-10

We recommend that agencies use the price benchmarks to establish price reasonableness as much as possible. The benchmarks are not the end-all, be-all of price reasonableness, but they can save time.

FEMP has benchmarks for some of the ECMs that are common in the program: lighting, chillers, variable-frequency drives (for fans and pumps), and ground source heat pumps. When you plot the price of these retrofits vs. the annual kWh savings, there’s not much variation. If you know that the price you’re offered is comparable with the prices received on other projects, you don’t need to spend a lot of time analyzing the price. Given the size of the ECM, your location, and the proposed price, these benchmarks can tell you how well that proposed price compares with prices from previously awarded projects.

If the benchmarking tool tells you your price is HIGH, you can ask the ESCO for more information. If your pricing appears very LOW compared to the benchmark, you may also want to ask for additional information. Especially on a preliminary assessment, a low price should be a red flag.

The ECM Locator, another FEMP tool, is for researching prices for ECMs that do not lend themselves to benchmarks. ECM Locator has data on where these ECMs have been installed in the past, what prices were paid, etc.

For documentation of your price reasonableness determination, you may want to “print screen” from the benchmarks and locator, and certainly document your discussions with estimators or technical experts.

U.S. DEPARTMENT OF **ENERGY** | Energy Efficiency & Renewable Energy

How to Access ECM Benchmarks and Locator

- Go to: hyperion.ornl.gov/escp
- Request a sign-on
- Tutorials are available for each tool

Benchmarks/locator make quick work of some ECMs — freeing up time for team to analyze prices of ECMs having no price comparison data.

L-11

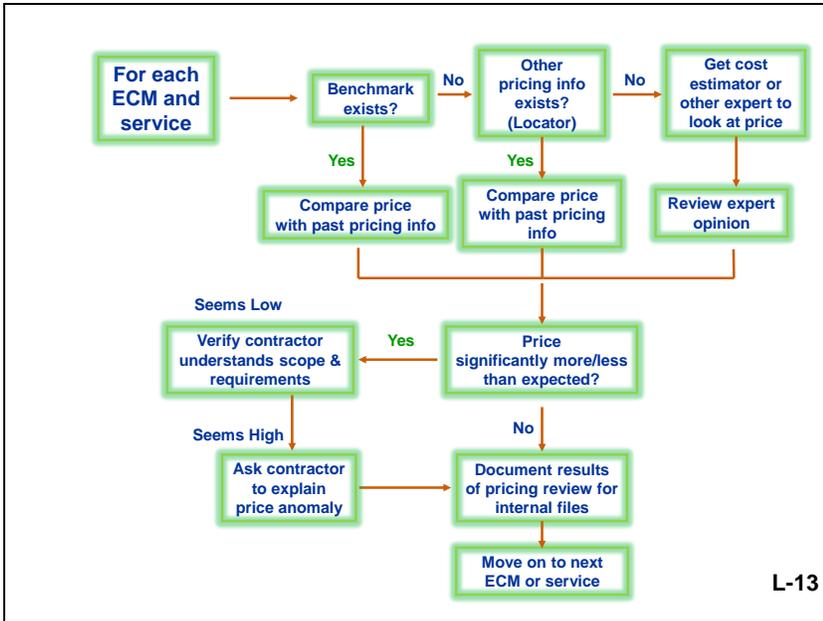
U.S. DEPARTMENT OF **ENERGY** | Energy Efficiency & Renewable Energy

ECM Pricing Review Strategy — Step 3

- If no benchmarking or locator data exist, the team must independently assess the ECM price for reasonableness

L-12

The benchmarks and the locator don't work for all ECMs. A good example is combined heating and power plants – each CHP project will be unique, so it's not possible to develop a benchmark. In this case, you may have to call in people with technical expertise – either with the technology, or with price estimation, or both – to help you make the price reasonableness determination.



Here is a diagram that lays out our recommended approach. Use benchmarks where you can. Use ECM locator to get the information on other ECMs. Where you need to, call in technical experts.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Don't forget that you have other resources as well:

- Project facilitator
- Site- and agency-level experts
- Site- and agency-level data
- National Laboratory experts on specific technologies
- Supporting information supplied by the ESCO (at whatever level you specify)
- Cost information from ESCO's subcontracts

L-14

There are many resources agencies can draw on to help with these issues, starting with your project facilitator. Larger agencies have experts and centers of expertise who can help, and many also collect data that may be useful. The technology experts at the national labs who are on the FEMP ESPC team can help with specific technologies. Also don't be afraid to ask the ESCO for more information. Cost information from their subcontract competitions should be very helpful, and they can make those offers available to you. It's your project, you're going to be living with it for a long time, so make sure you're getting a good deal.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Review — True or False?

- The ESPC legislation stresses life-cycle cost-effectiveness.
- The DOE Rule (10 CFR 436) waives requirements for submission of certified cost data for ESPCs.
- The agency can specify whatever requirements for ESCO submission of pricing information it deems necessary in the TO-RFP.
- FAR requirements on contract pricing do not apply to ESPCs.
- Price reasonableness determination is an agency responsibility.

L-15

U.S. DEPARTMENT OF **ENERGY** Energy Efficiency & Renewable Energy

Next: Hands-On Learning — Review of the Proposal



Next
Presentation
Module:
Phase 4 ▶

L-16

M – Phase 4: Implementation — Design – Construction – Acceptance

**Phase 4: Implementation
Design – Construction – Acceptance**

National Renewable Energy Laboratory

M-1

Federal Energy Management Program | fem.energy.gov

Milestones in the ESPC Process

• Acquisition Planning	Phase 1
• ESCO Selection	2
• Preliminary Assessment	2
• Notice of Intent to Award	2
• Request for Proposal	3
• Investment-Grade Audit	3
• Proposal	3
• Task Order Award	3
• Final Design and Construction	4
• Project Acceptance	4
• Post-Acceptance Performance Period	5

Phase 4: Implementation

Phase 4: Project Implementation – Design, Construction, Project Acceptance
1 – 2 years or longer

Phase 5: Post-Acceptance Performance
Up to 25 years including construction

- ★ Post-Award Conference
 - ★ **Project Design and Review**
 - Final Project Design
 - Design Submittals
 - ★ Agency review and approval
 - ★ □ ESCO provides insurance and bonds
 - ★ Notice to Proceed with Construction
 - **Construction**, inspections, documentation, training*
 - Commissioning and Post-Installation M&V*
 - ★ Acceptance of installed project

Key
 ★ Agency Action
 □ ESCO Action
 *With Agency Participation/Oversight

M-3

Federal Energy Management Program | fem.energy.gov

There is very little difference between this phase of an ESPC project and any other construction project. The DOE IDIQ ESPC contains all the clauses that normally appear in a government construction project.

The main differences between ESPC and a conventional construction contract are the requirements for commissioning and post-installation M&V. The DOE ESPC IDIQ specifies that acceptance of the project cannot be completed until the equipment’s performance is proven by M&V activities after installation and documented in the post-installation M&V report.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Post-Award Conference

- Participants
 - Agency —
CO, COTRs, inspectors, others on acquisition team
 - ESCO —
Project manager, design, construction, commissioning, M&V, and performance-period services personnel
- Purpose
 - Review roles, responsibilities, expectations, timelines, and communication protocols
 - Review schedules for design, construction
 - Establish protocols for site access and submittal review

M-4

Federal Energy Management Program femp.energy.gov

A post-award conference is recommended to cement the foundation for a strong working relationship between the ESCO and the government during implementation of the project.

Recommended attendees include the Agency Administrative Contracting Officer, agency Contracting Officer Representatives (COTRs) and technical teams (e.g., design engineers) responsible for contract administration, ESCO Project Manager, and ESCO or subcontractor design, construction, commissioning, M&V, and service manager personnel.

The objectives of the post-award conference are similar to those of earlier kickoff meetings — to establish roles, responsibilities, expectations, timelines, and communications protocols.

At this stage the ESCO and the agency will also review details pertinent to the ECM installation, post-installation inspections, commissioning, training, acceptance, operations, maintenance, and other aspects of contract performance, and establish protocols for site access and the submittal review process.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Submittals (per IDIQ § C.5 and TO RFP)

- Design and construction submittals
 - Designs, drawings, installation plans
 - Manufacturer’s cut sheets for actual equipment to be installed
 - Construction schedule
- See Sample Deliverables for Task Orders, Attachment J-4 of IDIQ

M-5

Federal Energy Management Program femp.energy.gov

The ESCO submits the design and construction package, quality control inspection program, and commissioning plan for all ECMs within the time frame specified in the proposal. The purpose of the design and construction package is to provide detailed information that allows the agency’s COR/COTR to confirm that the ECMs will be installed in a manner that complies with contract requirements and the agency’s requirements. The ECMs must be as described in the proposal and must meet the design and construction standards in the contract.

The ESCO’s designs, plans, and schedules must be approved before construction may begin. The process for submittal and review of the ESCO’s designs and construction and installation plans are defined in IDIQ § C.5, as supplemented by the TO RFP. The ESCO’s submittals constitute requirements of the contract after approval by the agency, per IDIQ contract Section C.5.1. Designs, equipment selections, and construction plans must conform to the standards given in Sections C.5.1 and C.5.2.

U.S. DEPARTMENT OF
ENERGY Energy Efficiency &
Renewable Energy

Design Review

- Agency reviews and verifies:
 - Compliance with requirements in TO
 - Design clearly addresses ECM interfaces with existing equipment
 - Drawing particulars are in compliance with TO
- FEMP ESPC team reviews for advanced technologies

M-6

Federal Energy Management Program femp.energy.gov

Design Review

The Agency COTR will review the design to confirm that it (1) complies with requirements in the TO, and (2) clearly addresses ECM interfaces with existing government equipment, and that (3) the drawings particulars (legends, format, size, engineering stamp requirements) are in accordance with the TO.

Upon review and acceptance of revised design, the COR/COTR will notify the ACO in writing of design approval.

U.S. DEPARTMENT OF
ENERGY Energy Efficiency &
Renewable Energy

ESCO's submittals constitute requirements of the contract after acceptance by agency

- Acceptance of submittals does not relieve ESCO of responsibility to meet facility standards of service and deliver guaranteed cost savings (IDIQ C.5.1.A).
- ESCO may not deviate from approved submittals.
 - If deviation is required, the deviation must be approved by the Contracting Officer prior to installation.

M-7

Federal Energy Management Program femp.energy.gov

Installation Plan Review

The Agency COTR will review the installation plans for compliance with the TO. The review should confirm the location of ECM installations, schedule, acceptable planned service interruptions, requirements for space access, and installation working hours. The COTR will review the ECM quality control inspection plan for acceptable logs/reports and proposed approach for quality control inspections of ESCO/subcontractor work. Review will also verify the schedule for equipment/system tests with the ESCO contact.

Any deficiencies in the installation plan should be communicated to the ESCO in writing for resolution and submittal of revised installation plans. The COTR should notify the CO in writing of installation plan approval.

U.S. DEPARTMENT OF
ENERGY Energy Efficiency &
Renewable Energy

Notice to Proceed with Installation



- CO issues notice AFTER:
 - ESCO provides
 - Acceptable performance and payment bonds (as required)
 - Insurance certificates
 - Agency approves
 - ESCO's designs and construction plans
 - Related submittals

M-8

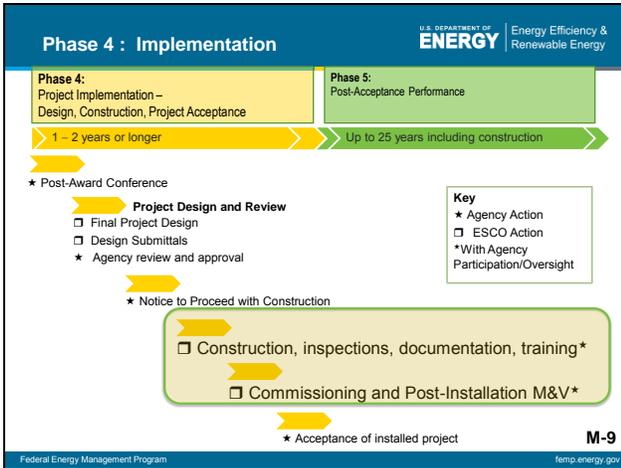
Federal Energy Management Program femp.energy.gov

Notice to Proceed with Installation

The agency contracting officer transmits a notice to proceed with ECM installation to the ESCO, indicating that construction may commence, after pre-award requirements are met.

Proof of Insurance / Payment and Performance Bonds

The CO must receive acceptable performance and payment bonds (as required) and any required insurance certificates before construction begins. (See IDIQ Attachment J.4, Sample Deliverables for Task Orders.)



The DOE IDIQ ESPC contains all the clauses that normally appear in a government construction project.

An ESPC differs from a conventional construction project in the ESPC’s contractual requirements for (1) submission of a commissioning (Cx) plan, execution of the Cx plan, and (2) post-installation M&V activities to prove the performance of the ECMs after installation and inspection.

The DOE ESPC IDIQ specifies that acceptance of the project cannot be completed until performance is proven by M&V activities and documented in the post-installation M&V report.

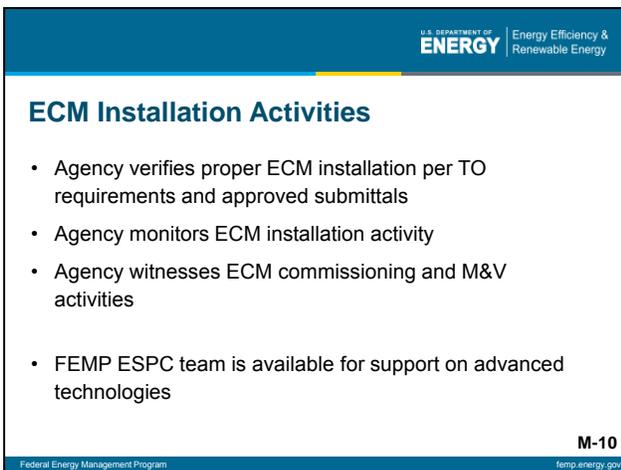
Commissioning and Post-Installation M&V

Post-Installation commissioning, inspections, and verifications are covered in the DOE ESPC IDIQ § E.

Installation and Construction

Before and during ECM installation, the ESCO provides the agency with required documents concerning installation procedures, such as a quality control plan, notification of work outside regular hours, planned utility outages, and ECM testing. The agency is responsible for monitoring the ESCO’s progress during ECM installation to ensure that the work is proceeding as planned.

A best practice for the construction period is to hold regularly scheduled progress meetings with the ESCO and agency teams. The attendance of the ESCO’s Site Superintendent’s should be required so that any issues can be addressed during the meetings.



Agency Activities During ECM Installation

- Monitors ECM installation activity
- Reviews and verifies construction QC plan logs
- Coordinates space access to prevent delays in installation
- Verifies proper ECM installation per TO requirements, design/installation plans, and approved submittals
- COTR generates punch lists as applicable

Government Witnessing in Implementation Period

Witness ECM commissioning and M&V tests to verify performance with focus on:

- Critical systems such energy management control system set points or chiller/boiler performance tests
- ECMs generating the most energy/cost savings
- Sampling proper installation of ECMs such as lighting, motors, VFDs

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

Agency Post-Installation Inspections and Verifications

- Agency verifies receipt and reviews:
 - As-built drawings in format specified in TO
 - O&M manuals & related O&M procedures
 - Spare parts lists and provided spare parts
 - Manufacturer warranties
 - ECM training materials & proposed schedule
 - Commissioning report
 - Post-installation M&V report

M-11

Federal Energy Management Program femp.energy.gov

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

COR Post-Installation Activities

- Verifies completion of construction punch list items
- Verifies resolution of any ECM performance deficiencies
 - FEMP can help with resolution of performance issues
- Verifies that any revised post-installation submittals are acceptable
- Coordinates agency staff training with ESCO
- Coordinates inspections of rebate-related ECMs with ESCO and utility

M-12

Federal Energy Management Program femp.energy.gov

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

Commissioning Report (IDIQ § C.5.4)

- Agency review of report should verify:
 - ESCO compliance with Commissioning Plan
 - Commissioning results meet or exceed design intent and facility performance requirements
 - Any seasonal testing to be required at later date
 - Example: Chiller performance test if ECM installation is completed before summer peak loads

M-13

Federal Energy Management Program femp.energy.gov

Commissioning

Just as all aspects of baseline performance (energy use, conditioned space temperatures and humidity, light levels, etc.) were captured and documented during the IGA and negotiated at award, similar data on the performance of the new equipment is gathered during commissioning. Commissioning is always done at the system level, and augmented with building energy use data if whole-building M&V methods are used.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Agency Reviews Post-Installation M&V Report

- Agency verifies ESCO compliance with M&V Plan, and that:
 - Energy and O&M baseline data is consistent with agreed-upon baseline conditions
 - Energy rates for first year of performance period are as specified in TO
 - Installed ECMs have the potential to meet or exceed the guaranteed annual cost savings
- FEMP ESPC Team also reviews Post-Installation Report

M-14

Federal Energy Management Program | femp.energy.gov

Although the bulk of commissioning is usually done prior to acceptance, other performance checks may be required by the ESCO after agency acceptance of ECM installation. For example, chiller performance should be assessed in summer and steam trap performance during winter, regardless of when acceptance occurs.

As required, the FEMP ESPC Team will witness functional performance tests of advanced technologies and provide written comments to the COTR.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Phase 4: Implementation

Phase 4: Project Implementation – Design, Construction, Project Acceptance

1 – 2 years or longer

- ★ Post-Award Conference
- ★ **Project Design and Review**
 - Final Project Design
 - Design Submittals
 - ★ Agency review and approval
 - ★ □ ESCO provides insurance and bonds
- ★ Notice to Proceed with Construction
- **Construction**, inspections, documentation, training*
- Commissioning and Post-Installation M&V*

Phase 5: Post-Acceptance Performance

Up to 25 years including construction

Key

- ★ Agency Action
- ESCO Action
- *With Agency Participation/Oversight

M-15

Federal Energy Management Program | femp.energy.gov

Project Acceptance

The timeframe for review and project acceptance is based on the schedule of M&V activities included in the M&V Plan or otherwise specified in the task order. The agency is obligated to perform its oversight and review in the timeframes described in the M&V plan. If the agency is unable to complete oversight and review, accept the project, and process payments to the ESCO on schedule, the ESCO may incur significant additional costs which the agency may be liable for.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Acceptance of Project Implementation – After All Post-Installation Submittals Are Approved (IDIQ § E.3)

- CO provides written notice of acceptance to ESCO
 - Confirms project complies with all TO requirements
 - Advises that ESCO may submit first invoice
 - Begins the performance period
- Early acceptance of individual ECMs saves on interest costs (IDIQ § E.3)
 - ECMs completed early in implementation period

M-16

Federal Energy Management Program | femp.energy.gov

Acceptance of Completed Project Installation

The agency’s CO indicates the agency’s acceptance of the installed project via a letter to the ESCO, including a signed copy of the completed acceptance checklist, after the COTR has confirmed the following:

- ECM installation has been accomplished as required, including resolution of punch list items and reinspection by COTR
- ECMs have the potential to generate the guaranteed cost savings
- All required and approved post-construction submittals have been received and as required have been revised to meet contract requirements

The ESCOs are generally highly motivated to resolve issues and achieve acceptance that all requirements of the contract have been met so that payments can begin.

The CO may issue a conditional letter of acceptance if seasonal testing is required for ECMs identified in the commissioning or post-installation M&V report.

It is an agency decision as to when they feel the project can be accepted. At agency discretion, the CO may accept a project even though minor punch list items or some services are not yet completed. The acceptance letter would document the outstanding items with a due date for completion.

A sample checklist for agency acceptance of completed ECM installation is provided on FEMP's ESPC Resources Web page (http://www1.eere.energy.gov/femp/financing/espcs_resources.html) under *Implementation, Construction, Project Acceptance*.

Acceptance of ECMs Before Final Project Acceptance

Individual ECMs may be provisionally accepted before final project acceptance, as most projects have ECMs that can be installed, tested, and operational prior to completed installation of all ECMs. Sign-off by a COTR doesn't constitute official agency acceptance of the ECM or the project. It acknowledges completion of the installation of that ECM and, and perhaps activates the warranty.

Partial acceptance of a project may be warranted or desirable for projects with one or two ECMs with very long construction periods and others having shorter construction periods, or projects with several sites involved. Agencies can reduce their interest cost by making payments based on savings from provisionally accepted ECMs during the implementation period. These implementation-period payments must be specified in Schedule TO-1, per IDIQ § E.3.

Final Agency/ESCO inspection. One final walk-through should be conducted with the COTR or other designated government representative. The ECMs should be fully operational, without performance problems, and all other required submittals should have been provided. The acceptance checklist is noted with dates for each item, signed off by the COTR, and forwarded to the CO.

U.S. DEPARTMENT OF
ENERGY Energy Efficiency &
 Renewable Energy

Handling Changes During Implementation Phase

- Variances between design and as-built installation
 - ESCO and agency should track changes
 - Changes and energy impacts should be documented in Post-Installation Report
- Preferred: Handle changes so that no revision of TO schedules or financing structure are required
- Timely negotiations preserve the project schedule

M-17
 Federal Energy Management Program femp.energy.gov

Changes or modifications are less common with ESPC projects than with business-as-usual energy project contracting, but they are sometimes needed. It is difficult to anticipate all requirements, and additional information may surface during installation. Be prepared to deal with changes when they come up.

Variances between design and installation are found on most projects. Details of the variations between the task order and as-built conditions are documented in the Post-Installation M&V Report, which includes energy impacts.

The CO (not just the COR) must authorize any changes, and all changes should be reviewed and agreed to in advance of the change. Contracts should be modified to reflect the changed conditions.

It is most feasible to do one modification to the TO for all changes made just prior to accepting the project. It is important that the ESCO and Agency come to agreement quickly so that project acceptance and payments are not unduly delayed.

Design vs As-Built

Variances between design and installation are found on most construction projects

- All changes should be reviewed and agreed to in advance by the CO and COR.
- ESCO and agency should track changes.
- Details should be documented in Post-Installation Report, including energy impacts.
- Modify contract, as necessary, to reflect changed conditions.

As-built drawings (blueprints/utility lines/etc) and submittals will reflect the project as approved and actually completed. The “as-built” drawings and documentation are needed to keep the facility’s records accurate. The post-installation report is customarily where changes are recorded, but it should be understood that this is not because the importance of this information is related only or mainly to M&V.

Some changes may be made at no cost or as exchanges of in-kind services or costs (for example, the addition of a small amount of lighting in exchange for a necessary two-month extension in construction time because of ESCO-caused delays in the project).

Generally all parties prefer to handle changes in ways that do not require renegotiation of the firm, fixed price [i.e., a revision to the payment stream in the TO-1 (Final) schedule] that might cause a corresponding effect on and renegotiation of the project financing.

Prepare for the Future – Audits, Personnel Turnover, Etc.

Ensure that all project documents are kept and maintained with the contract file so they will be available throughout the contract term. These documents include, especially, M&V and commissioning data and reports, O&M manuals, and O&M training materials.

In addition to other project documentation, the agency should record the ESPC project’s impacts in the real property data base.

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Prepare for Contract Administration

- Follow your Contract Management Plan – This is the plan that ensures continuity of contract administration as individuals come and go
 - Prepare Plan at TO award
 - Follow the plan or modify during design/construction and after project acceptance
- Maintain all ESPC project documents — especially M&V and commissioning data and O&M manuals and training materials
 - Audits, turnover, ...

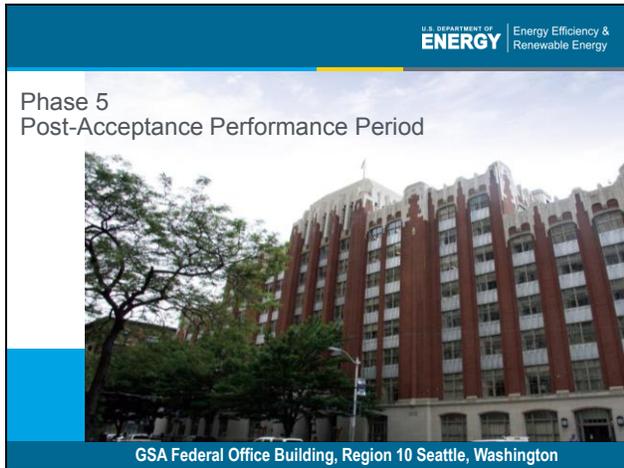
M-18
Federal Energy Management Program | fem.energy.gov



Next: N Phase 5 – Post-Acceptance Performance Period ▶ M-21

Federal Energy Management Program | fem.energy.gov

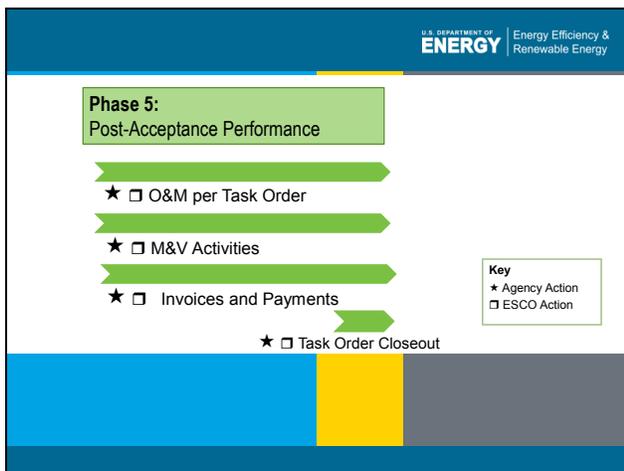
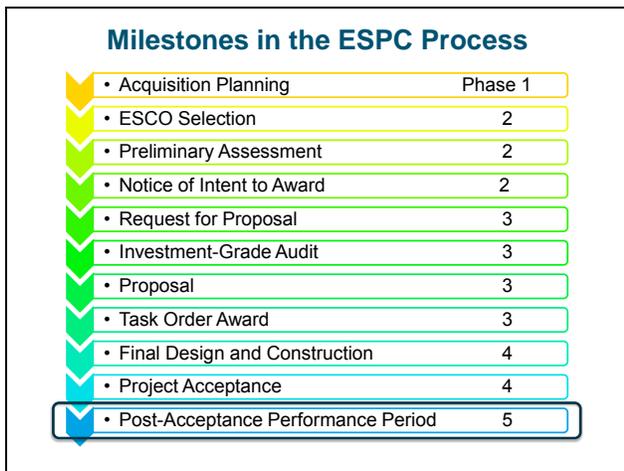
N – Phase 5 – Post-Acceptance Performance



General Services Administration Federal Office Building, Region 10 Seattle, Washington

The historic GSA Federal Office Building, Seattle, is one of the most efficient in the Federal government's inventory. Building upgrades included the installation of highly efficient lighting, improved elevator controls, and new building control system panels. The project received ,000 in utility rebates from Seattle City Light. Using less than 30,000 Btu's per gross square foot, it earned an Energy Star rating of 99.

(Courtesy of NREL Image Gallery)



U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Getting construction finished and paying the invoices is not enough in federal ESPCs.

★ Agencies are responsible for making sure the government complies with its contractual responsibilities and ensuring that guaranteed savings are achieved.

Agencies can bank on being held accountable for these responsibilities.

N-4

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

O&M and R&R of Installed Equipment

- O&M and R&R of installed equipment are the ESCO's responsibility
 - However, performance of O&M or R&R tasks may be assigned to ESCO or agency
 - General approach and allocation of responsibilities are outlined in RRRPM
- For each ECM, the TO should specify
 - Who will carry out O&M and R&R tasks
 - How performance will be verified
 - What to do if tasks are not performed
- **If agency does not meet its O&M or R&R obligations, the guarantee may be compromised.**

N-5

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

If government performs O&M

- Task order will contain
 - Performance requirements (what & when)
 - Requirements for agency record keeping
 - Provisions for ESCO to monitor and document agency performance
- ESCO is still responsible for O&M and R&R
 - Provides O&M manuals defining O&M procedures
 - Provides training to agency on O&M
 - Notifies site of any deficiencies in O&M and R&R

N-6

Maintenance and repair of the installed equipment is the responsibility of the ESCO. However, performance may be assigned to the ESCO or agency.

Allocation of responsibility for performance of O&M/R&R tasks between the agency and ESCO is defined generally in the Risk, Responsibility, and Performance Matrix. Details of each party's responsibilities may be specified in the Management Approach in the Final Proposal, in the M&V Plan, and in O&M training manuals/materials that the ESCO is required to provide.

Government Responsibility for O&M/R&R

Although responsibility for maintenance and repairs is the ESCO's, performance of O&M and R&R tasks is negotiable. When the government agrees to perform operations, maintenance, repair, or replacement of installed equipment, the task order should be specific about what the ESCO requires the government to do and the records the agency should maintain.

As the ESCO is ultimately responsible for equipment performance there will be provisions for the ESCO to verify agency performance. Additionally, annual M&V reports will identify any deficiencies in operations, maintenance, repair or replacement throughout the year.

If the government consistently fails to perform the agreed to O&M and R&R, the annual M&V report may also report the impact on equipment performance.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

The task order may also define:

- Criteria for ESCO to take over operations
- Criteria for ESCO to take over maintenance prior to equipment failure
- How ESCO is to be paid for performing government's activities

N-7

If the government agrees to perform O&M or R&R, the task order may provide for the ESCO to take over O&M or R&R responsibilities if the government does not meet the contractual obligations and equipment performance is compromised. This could include having the ESCO take over performance of tasks. As a practical matter, site access may be limited, and no method for paying the ESCO for these tasks would be set up in the contract, so further discussions would need to occur.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Bottom line: Be aware of site's O&M and R&R responsibilities

- Ensure that O&M and R&R responsibility allocation is clearly understood for each ECM
- If site performs O&M and/or R&R
 - Comply with ESCO's O&M manuals and TO instructions
 - Maintain O&M and R&R records per TO requirements
 - Ensure that personnel receive training and have access to O&M manual

N-8

Agencies should know what they have signed up to do! This also means ensuring that the Risk, Responsibility and Performance Matrix defines the general O&M and R&R approach, that procedures for the agency to follow have been identified in the task order contract and/or equipment manuals, and that the agency has received the necessary training on all installed equipment.

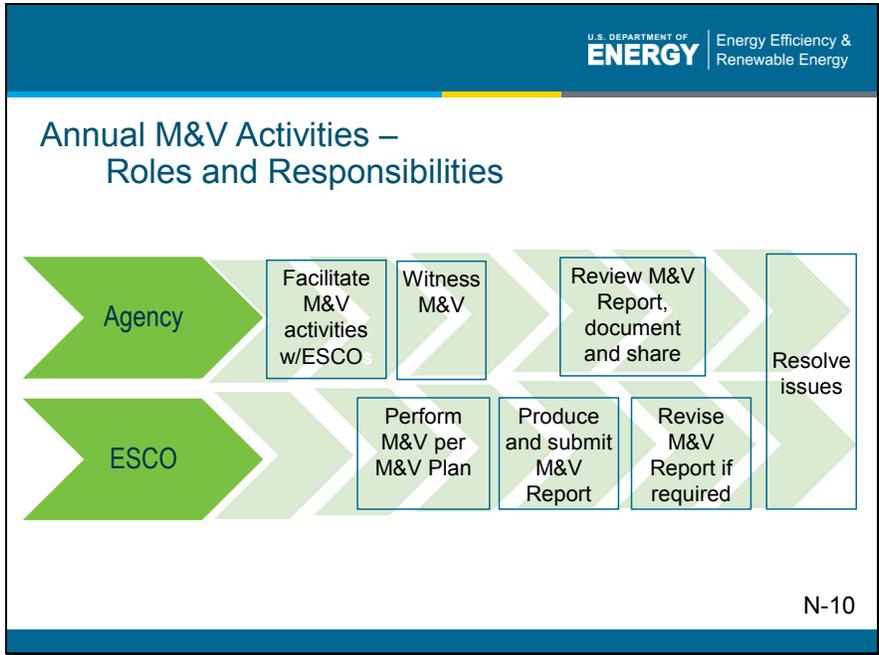
Although the ESCO is responsible for providing manuals and training, the frequency and format of training is negotiable. Agencies should participate actively to ensure that operations, preventative maintenance and repair and replacement are performed in accordance with contract terms. In addition, records should be maintained to document performance.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Refer to Guidance on O&M on FEMP Web Site

- *Planning and Reporting for Operations & Maintenance in Federal Energy Savings Performance Contracts*
- *FEMP O&M Best Practices: A Guide to Achieving Operational Efficiency*
- *ASHRAE Guideline 4: Preparation of Operating and Maintenance Documentation for Building Systems*, Atlanta, GA: ASHRAE, 1993.

N-9



Annual Measurement and Verification of savings is legally and contractually required in ESPCs. FEMP provides guidance to assist agencies on how to actively participate in witnessing ESCO M&V activities and in review of annual M&V reports. When a DOE project facilitator (PF) is engaged, the PF reviews the first annual M&V report.

This slide, titled "Agency Facilitates M&V Activities with ESCO", is from the U.S. Department of Energy, Energy Efficiency & Renewable Energy. It lists the following responsibilities for the Agency:

- Provide for ESCO, as needed to carry out M&V:
 - Access, data, escort
 - Records: Utility bills, maintenance, occupancy, etc.
- Coordinate meeting to plan ESCO site visit
- Schedule M&V inspections/data collection
 - Schedule for actual operating conditions and availability of key personnel

The slide is labeled "N-11" in the bottom right corner.

Responsibilities of Agency COR/Designated Witness

- Communicate with ESCO about M&V needs
 - Access, data, operating staff availability, etc.
- Coordinate meeting between ESCO and agency witness/COTR to plan ESCO site visit
- Schedule M&V inspections/data collection
 - Schedule for actual operating conditions and availability of key personnel
- Review pertinent records and provide to ESCO
 - Utility bills, maintenance, occupancy, etc.
- Provide escort besides witness/COTR if necessary

Formal Delegation of COR Responsibilities

A written delegation letter from the CO for the COR should include witnessing and reviewing M&V.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

Government Witnessing of M&V is

- Agency observation and understanding of M&V procedures, tests, and calculations
- Why witness?
 - Gain independent confirmation of ECM performance (and savings)
 - Be prepared for future audits
 - Part of agency ESPC administration responsibility
 - Promote mutual understanding and ownership in agency-ESCO partnership

N-12

Witnessing is recommended primarily to

- (1) ensure that both agency and ESCO communicate clearly and fully understand the M&V of savings that justifies payments being made to the ESCO, and
- (2) provide increased confidence for the agency that savings expected under the ESPC are being achieved.

The intent is for active facilitation and observation of ESCO M&V activities by designated agency personnel to speed the process of ESCO conduct of M&V and agency review of the resulting reports, as well as to prevent disputes about performance.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

Government Witnessing of M&V

- Agency designates witness/COR
- Witness/COR must prepare for and coordinate ESCO M&V site visit
 - Review and understand M&V plan, ECM descriptions, etc.
 - Observe inspections, tests, and measurements
 - Document observations
 - Ask ESCO about problems or questions that have come up during the year
- Graded approach is practical
 - Prioritize to focus on ECMs that contribute most savings and/or represent greatest risk or uncertainty

N-13

A Graded Approach to Witnessing

FEMP's guidance recognizes that many agencies may be limited in time and expertise to devote to witnessing, and therefore suggests that a prioritized or graded approach to government witnessing may be considered. FEMP's *Reviewing Post-Installation and Annual Reports* (p. 4., Step 3) recommends placing priority on the ECMs that account for the greatest share of the savings:

“Principal review efforts should be focused on the measures providing the largest portion of the cost

savings for the project. This strategy of reviewing the principal cost saving measures first will help the reviewer spend the smallest amount of time while maximizing the value of the review, and is especially helpful when review time is limited. Complete a detailed review of each ECM if possible.”

Recommended Steps for Facilitating and Witnessing M&V Inspection

1. Conduct meeting with agency COR/witness and ESCO personnel to review the schedule, access requirements, and tests and monitoring that the ESCO intends to perform. This will both ensure that the inspection goes smoothly and that both parties understand how the performance of ECMs is to be tested and what constitutes performance that meets the terms of the contract. Any participation by agency personnel to facilitate M&V tests and monitoring, either during or after the visit (e.g., operating equipment for testing, recording or transmitting information from data loggers) should be agreed upon.
2. Provide any utility, occupancy, or O&M data or records needed by the ESCO that could not be provided in advance.
3. Escort ESCO personnel, observe tests or observations performed, record test or measurement equipment used, record results if available on site, and obtain any needed clarification of how tests are being performed. Ensure that all needed access is provided and that all agreed upon tests are performed, and record any anomalies that affect M&V (e.g., equipment not operable and available for testing). Record any observed

malfunctions either of ECMs or monitoring equipment. Sign the data collection forms that record these observations.

4. Ensure that facility operating staff bring to the attention of the ESCO any problems they have experienced with ECM performance.

Note that for inspections for initial post-installation M&V and/or commissioning, agency witnessing should include, for critical ECMs, confirmation that the equipment installed is what was specified, and that it was properly installed in accordance with applicable M&V and commissioning plans.

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

FEMP Guidance on Witnessing

- FEMP Guidance on witnessing
 - Guide to Government Witnessing and Review of Post-Installation and Annual M&V Activities
 - Available on FEMP ESPC resources page
- **Trust, but Verify!!**

N-14

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Review of M&V report ideally verifies that

- M&V plan was followed
- Field-measured values were carried over to report
- Factors held constant for calculations are per task order
- Calculations are correct and follow the M&V plan
- Utility and escalation rates used to calculate cost savings are correct
- Report provides all required information
- Savings guarantees were met
- FEMP guidance: Reviewing Post-Installation and Annual Reports for Federal ESPC Projects, February 2007

N-15

Agencies should complete timely reviews of M&V reports.

A review of the report ideally verifies that:

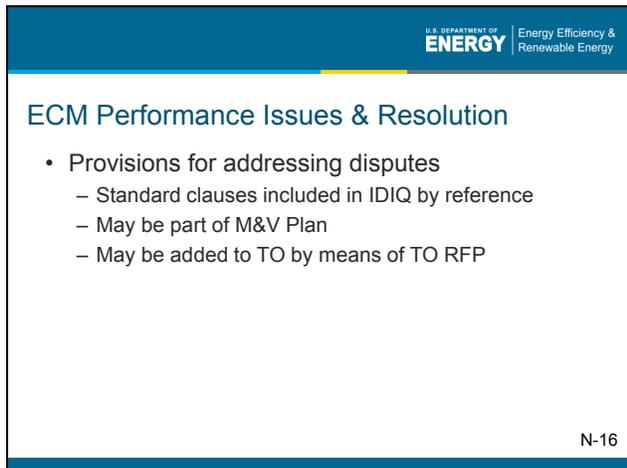
- M&V plan was followed
- Guaranteed energy and cost savings were met
- Equipment is performing at agreed to levels
- Operations, maintenance, repair and replacement satisfy performance criteria to verify the potential of the ECMs to save in the future
- Identification of performance or savings issues for resolution

Many agencies use custom reports and checklists to assist with review of M&V reports. These include detailed steps to help agencies ensure that contractual requirements were met and may include ensuring the following:

- Report provides all required information
- Report is in the correct format: IDIQ attachment J-9 (Post-Installation Reports) and J-10 (Annual Reports)
- Field-measured values were carried over to report
- Factors held constant for calculations are per task order
- Calculations are correct and follow the M&V plan
- Utility and escalation rates used to calculate cost savings are consistent with the contract
- Agency performing O&M and R&R as applicable
- Useful feedback on the performance of each measure

When applicable, the report should provide an explanation of any differences between estimated and reported savings and contain information on what corrective actions will or should be taken and by whom. Any required action should be taken on the key issues identified in the report or agency review.

After agency technical review of the M&V report, results of review should be provided to the agency contracting officer. Any shortfalls, exceptions, or discrepancies should be discussed with the ESCO. ESCOs should also be notified if M&V report revisions are required. Once the report is finalized and accepted by the agency, a copy should be added to the contract file. Some agencies document M&V report acceptance through a contract modification.



U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

ECM Performance Issues & Resolution

- Provisions for addressing disputes
 - Standard clauses included in IDIQ by reference
 - May be part of M&V Plan
 - May be added to TO by means of TO RFP

N-16

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Savings Shortfalls

- If M&V report shows savings shortfall
 - ESCO is responsible for resolving ECM performance issues and proposing remediation options
 - Agency withholds part of payment equal to shortfall, and restores payments after issues are resolved
- If agency is found to be (contractually) responsible for shortfall, payments per the TO schedules would continue.

N-17

Annual Reconciliation of Energy Savings Performance

If the actual annual savings, as determined by M&V, are less than the annual guaranteed savings amount, the ESCO must correct or resolve the situation or negotiate a change. Reconciliation of savings generally occurs annually. The guidance for reconciliation and the process for resolving disputes are specified in the IDIQ contract (as modified by the TO RFP).

Review and comment on reports should be conducted in a timely fashion, payments should not be delayed for issues that do not have a material impact on savings, and any payments withheld should be proportional to the perceived savings discrepancy or performance shortfall. Any dispute between agency and ESCO must be resolved in a manner consistent with the dispute resolution language in the M&V plan, the IDIQ, and the TO RFP.

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Invoices and Payments

- Invoices begin after agency CO has formally accepted the project
- Usually annual, at beginning of performance year
- Agency is responsible for verifying that invoices contain any required documentation of services provided before paying

N-18

Invoices and Payments

Written notification from the agency to the ESCO confirming that the installation complies with the terms of the contract and has been accepted marks the point where the ESCO may submit invoices to the agency. Invoicing and payments can be done monthly, annually, or at other negotiated intervals. The agency is responsible for verifying that invoices reflect reported and verified savings and are of appropriate format before issuing payment.

The timeframe for review and acceptance is based on the schedule of M&V activities included in the M&V Plan or otherwise specified in the task order. The agency is obligated to perform its oversight and review in the timeframes described in the M&V plan. If the agency is unable to complete oversight and review, accept the project, and process payments to the ESCO on schedule, the ESCO may incur significant additional costs which the agency may be liable for.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Change and Contract Mods

- Modifications after acceptance are often administrative, such as:
 - Putting money on the contract to make a payment
 - Change in CO/COR
 - Documenting M&V report acceptance
 - Documenting changed conditions
- Consider what contract actions would be required if the agency/site decides to
 - Remodel part or all of the building
 - Demolish or remove buildings from service
 - Replace equipment with better technology

N-19

Agencies are responsible for ensuring that contract files are up to date and that contracts are consistent with current conditions. When contract modifications are required due to changed conditions, such as equipment removal, replacements, demolitions, or other reasons, the modifications should be performed timely. Any changes to contractual performance or savings parameters should be stated.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Partial or Complete Termination

- Follow the FAR Part 49
- Use the TO – 5 schedule
 - Shows outstanding capital investment on entire project
- Partial termination can occur when:
 - Buildings are being shut down, excess savings allow for buyout of ECM, other
- Complete termination
 - Shutdown of site

N-20

ESPCs are subject to FAR Part 49, Termination of Contracts. Schedule TO-5 Annual Cancellation Ceiling Schedule is a requirement of the IDIQ. This schedule shows the not-to-exceed termination liability for each year of the post acceptance period. The ESCO may also list the ceiling amount for each month.

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency & Renewable Energy

Quality Assurance During the ESPC Performance Period

and

FEMP Life-of-Contract Services



U.S. DEPARTMENT OF **ENERGY** | Energy Efficiency & Renewable Energy

The Only Certainty Over Time is Change

- Things WILL change over the life of the contract – use of buildings, mission, etc.
- CO administration of change is usually required

The LOC Concept: Help with Annual M&V and Changes Over Term of ESPC Contracts

- Ensure that guaranteed savings are realized and ESCO and agency comply with their contractual obligations throughout contract term
- *All sites having DOE IDIQ ESPC projects in the performance period will get FEMP LOC services*

N-22

U.S. DEPARTMENT OF **ENERGY** | Energy Efficiency & Renewable Energy

QA Goals: Elements of ESPC Quality

- Guaranteed savings are delivered
- Equipment maintained and operated correctly to satisfy performance criteria and deliver savings
- ESCO performing M&V according to plan and schedule
- Site fulfilling its inspection, O&M, witnessing, and M&V review responsibilities
- Continuity of awareness of ESPC is maintained throughout the performance period
- Site has access to latest FEMP tools and guidance

N-23

U.S. DEPARTMENT OF **ENERGY** | Energy Efficiency & Renewable Energy

FEMP LOC Services Address Quality Goals and Help Manage Change

- Reminders/facilitation of M&V process
 - One call before M&V, one call after M&V
- Assistance with contract modifications
- Technical assistance with performance issues
- Track responsible CO, COR, COTR, technical staff
- Keep backup copies of key documentation
- Make staff aware of FEMP training and guidance

N-24

U.S. DEPARTMENT OF
ENERGY | Energy Efficiency &
Renewable Energy

Closeout of Task Order

- Agency notifies ESCO by letter that the performance period is over and payments will cease
- If title to equipment and systems was not transferred to agency at time of project acceptance, ESCO transfers title now
- Submit the final Past Performance Evaluation to the PPIRS
- Agency may negotiate for continuing services from ESCO
- Complete all other closeout documentation consistent with agency procedures

N-25

PPIRS stands for Past Performance Information Retrieval System and is the mandatory performance reporting system for all federal agencies.

End of Contract Term and Closeout of Task Order

At the end of the contract term, the agency notifies the ESCO by letter that the performance period is over and payments cease.

Title Transfer

The title may be held by the agency or the ESCO during the contract term, depending on which option is most advantageous to the economics of the project. Taxation, agency policies regarding real property holdings, or other factors may influence this decision. In any case, at acceptance of the installation or at the end of the contract term, title will be transferred to the agency. If the transfer occurs at the end of the contract term, it becomes part of the closeout process. Most agencies currently transfer title at acceptance of the installation and the initial M&V report, after confirmation of the guaranteed savings.

**Exercise 6 —
Reviewing M&V Reports**

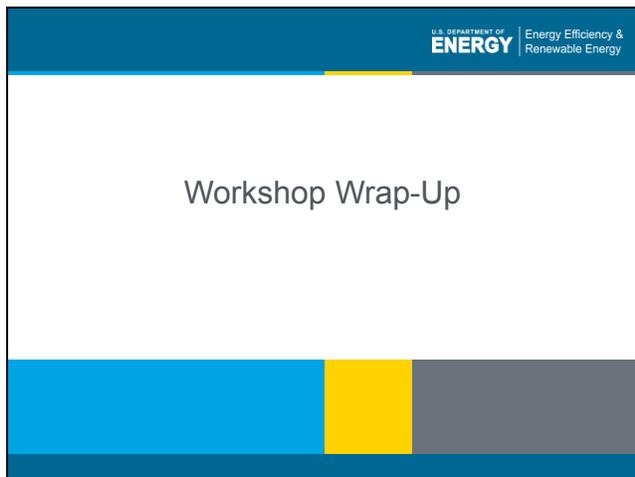
See Case Study Documents N2 and N3,
Post-Installation M&V Report and
First-Year M&V Report



N-28



Workshop Wrap-Up



U.S. DEPARTMENT OF ENERGY Energy Efficiency & Renewable Energy

CEUs for FEMP Training

- FEMP is seeking to become accredited and authorized to award certified continuing education units (CEUs)
- FEMP is now demonstrating compliance
 - Required to gain accreditation
- Prior to FEMP's accreditation
 - Changes are not obvious to participants, but do improve training
 - *Non-accredited FEMP CEUs* will be awarded upon successful completion of a FEMP training event

N-2

U.S. DEPARTMENT OF ENERGY Energy Efficiency & Renewable Energy

Students must complete on-line test and course evaluation to receive certificate

- Follow this link to WBDG:
 - <http://www.wbdg.org/education/femplt06112013.php>
 - Link is available only to attendees, only for two weeks
- Enroll/Register
 - Enroll only once – the site will thereafter keep records of all the student's training
- Take the test
 - Min. 80% correct answers required to pass
- Complete the evaluation to receive your certificate
 - For access to records/download certificates, click "My Account" on WBDG home page tab

N-3

U.S. DEPARTMENT OF **ENERGY** Energy Efficiency & Renewable Energy

To Access the Test

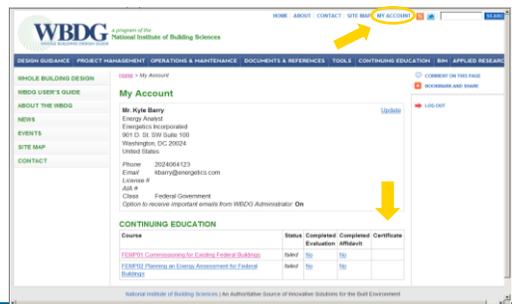
- Register with the WBDG to take the required test and complete the course evaluation.



U.S. DEPARTMENT OF **ENERGY** Energy Efficiency & Renewable Energy

To Receive Certificate

- Click on the "My Account" tab to access your permanent records
- Records and Certificates accessible 24/7



Course	Status	Completed	Certificate Evaluation	Efficient
ESB211 Commission for Existing Federal Buildings	Not	Not		
ESB212 Commission for Existing Federal Buildings	Not	Not		