UESC Process Overview
We’d like to get to know you…

Please introduce yourself:

- Tell us your facility/job function.
- Questions & expectations?
- Tell us about your potential project.
During this presentation, we will:

- Present the steps involved in developing Utility Energy Service Contracts.
- Identify tools and resources available to assist you in implementing your project.
Federal Energy Management Program (FEMP) – Mission

Federal Energy Management Requirements
The Federal Energy Management Program (FEMP) facilitates the Federal Government’s implementation of sound, cost-effective energy management and investment practices to enhance the nation’s energy security and environmental stewardship.
P.L. 110-140 (H.R. 6)
ENERGY INDEPENDENCE AND SECURITY ACT (EISA) OF 2007

FEMP Guidance Resource for the EISA: New and Enhanced FEMP Responsibilities

http://www1.eere.energy.gov/femp/pdfs/eisa_femp.pdf
Section 431 adopts the energy intensity reduction goals of Executive Order 13423 beginning in FY 2008

- Reduce Btu per gross square foot:
  - 9% in 2008
  - 12% in 2009
  - 15% in 2010
  - 18% in 2011
  - 21% in 2012
  - 24% in 2013
  - 27% in 2012
  - 30% in 2015

- Compared to FY 2003 base year
Section 432 establishes a framework for facility project management

- Agencies must identify all “covered facilities” that constitute at least 75% of energy use.
- Each facility must have a designated energy manager responsible for:
  - Completing comprehensive energy and water evaluations (25% of facilities each year)
  - Implementing identified ECMs; (bundling permitted)
  - Following up on implemented ECMs
- Web-based tracking system to certify compliance; including each facility’s potential measures, estimated cost and savings of measures.
  - Tracking system will be available to Congress, other Federal agencies, industry, and the public
    - Some specific data exempted from disclosure for national security purposes.
- In addition to tracking system, energy managers shall enter energy use data for each facility into a benchmarking system (i.e., Energy Star Portfolio Manager)
Facility Management Requirements (cont’d)

Energy Independence & Security Act of 2007 - Overview

- DOE Guidance/Decisions:
  - guidelines on designating energy managers criteria for covered facilities and
  - guidelines for project implementation and follow-up measures
    Select benchmarking system (Energy Star) or develop another
    OMB energy scorecards to be based on the requirements of Section 432
  - Scorecards available to Congress, other Federal agencies, and the public

- Authorizes agencies to use appropriations, private financing, or a combination to comply with its requirements
  - Resource Energy Managers (REMs) for assigned energy managers
  - ESPCs, UESCs for evaluations/project implementation

Section 434(b), Metering: Not later than 1 Oct 2016, each agency shall provide for equivalent metering of natural gas and steam (as currently required for electricity)
Section 433, Federal Building Energy Efficiency Performance Standards, directs DOE to issue revised Federal building standards that:

- require that the fossil fuel-generated energy use of the new buildings is reduced (compared to 2003) by:
  - 55% for 2010
  - 65% for 2015
  - 80% for 2020
  - 90% for 2025
  - 100% for 2030
- require that sustainable design principles shall be applied
Section 434 requires that each Federal agency ensure that major renovations/expansions employ the most energy efficient designs, systems, equipment, and controls that are life-cycle cost effective. Each Federal agency shall:

- Develop a process for reviewing each decision made on a large capital energy investment to ensure that the requirements are met; and
- Report to the Director of the Office of Management and Budget on the process established.

Section 523 requires 30 percent of the hot water demand in new Federal buildings (and major renovations) to be met with solar hot water equipment, provided it is life-cycle cost-effective.
Section 435 prohibits Federal agencies, effective 19 Dec 2010, from leasing buildings that have not earned an EPA Energy Star label. Exemptions are provided if:

- no space is available in a labeled building that meets the functional requirements of an agency, including locational needs;
- the agency proposes to remain in a building that the agency has occupied previously;
- the agency proposes to lease a building of historical, architectural, or cultural significance (as defined in section 3306(a)(4) of title 40, United States Code) or space in such a building; or
- the lease is for not more than 10,000 gross square feet of space.
Section 436, High-Performance Green Federal Buildings, directs GSA to establish Federal High-Performance Green Building Office and Advisory Committee to:

- coordinate outreach with other agencies
- establish green practices and standards for the Federal sector
- review/analyze current Federal budget practices and life-cycle costing issues

For conducting life-cycle cost calculations

Section 441, Public Building Life-Cycle Costs, increases the time period from 25 years, in prior law, to 40 years.

- Provide findings to DOE regarding a certification system identifying new and existing Federal facilities as high-performance green buildings
  - Section 433 requires DOE to identify certification system and level
- Identify incentives to expedite H-P green buildings
  - recognition awards
  - retention of savings for re-investment
Sec 513: Promoting Long-Term ESPCs and Verifying Savings

- Prohibits agencies from establishing a policy to limit ESPC, *and all privately financed contract vehicles*, projects to less than the *maximum 25 year term*

- Prohibits agencies from establishing policies to limit the size of individual projects

Sec 514: Permanent Reauthorization

- Deletes sunset provision, authorizes ESPC permanently
Energy Independence & Security Act of 2007 - Overview

- **Section 522** prohibits, except under certain circumstances, the purchase of incandescent light bulbs for use in Coast Guard office buildings.

- **Section 524** encourages Federal agencies to minimize standby energy use in purchases of energy-using equipment.

- **Section 525** requires Federal procurement to focus on use of Energy Star and FEMP-designated products.
Energy Independence & Security Act of 2007 - Overview

http://www1.eere.energy.gov/femp/pdfs/eisa_femp.pdf
Renewables
- At least half of the statutorily required renewable energy (7.5% by FY 2013) from new renewable sources (EO, EPACT)

Water
- Reduce water consumption intensity 16% by the end of FY 2015 (EO)

Green Buildings
- New Construction/Major Renovations to comply with the Guiding Principles
- 15% of existing building inventory must comply by the end of FY 2015
  - http://www.wbdg.org/references/sustainable_eo.php
  - Additional guidance to be completed by end of FY08
Executive Order 13514

*Federal Leadership in Environmental, Energy, and Economic Performance, signed October 2009*
EO 13514 mandates agencies to develop an **Integrated Agency Strategy for Sustainability** - including reduction targets:

- Greenhouse Gas Emissions
- Energy Efficiency
- Sustainable Federal Buildings
- Sustainable Acquisition
- Electronic Stewardship
- Environmental Management
- Water Use Efficiency & Management
- Pollution Prevention & Waste Elimination
- Regional & Local Integrated Planning

To lead by example and achieve a clean energy economy
- Reduce energy intensity in buildings
- Increase use of renewable energy
- Implement on-site renewable energy generation projects
- Reduce fossil fuels use:
  - Low GHG Emitting Vehicles (including alternative fuel vehicles)
  - Optimize number of fleet vehicles
  - Reduce vehicle petroleum use 2% annually
    - FY2005 (baseline year) through FY2020

Questions?
Visit FedCenter.gov
Contact the Office of the Federal Environmental Executive at info@ofee.gov
Utility Energy Services Contracts

Basics
Utility Energy Services Contracts are contracts that allow utilities to provide their federal customer agencies with comprehensive energy and water efficiency improvements and demand reduction services.
Energy Conservation Measures (ECM)

Sample List

- Interior and exterior lighting replacement & lighting controls
- Energy management control system
- HVAC equipment and/or system replacement or retrofit
- Water conservation device or control installation
- Construction of alternative generation or cogeneration facilities
- Commissioning of HVAC systems and components
- Operations & maintenance of ECMs
- Other ECMs that are cost effective and encourage the use of renewable energy, reduce energy consumption, and/or energy demand
UESC Process:

- Utility provides comprehensive assessment of cost effective EE / RE / H₂O opportunities
- Utility fronts the capital costs of the assessment, design, construction, performance testing, and other optional services like O&M, Commissioning, and M&V
- Agency agrees to pay for the costs of services and construction either from appropriations or from project financing, or a combination of the two
UESC - Basics
Utility Services
A utility incentive program is any service offered by a utility or developed in conjunction with an agency that assists customers in implementing energy and water conservation projects.
Utility Incentive Programs

Options for Agency Exploration

- Rebates/Audits
- DSM Bidding
- UESC
Utility Incentive Programs

**Definition**

**Energy Efficiency Programs:**

- **Public Purpose Programs** are administered by utilities, state agencies or other 3rd parties; and are paid for by ratepayers through “systems benefits charges”
- **Utility programs** are administered by the utility and paid for by ratepayers through their bundled rates

**Demand Response / Load Management Programs:** provide incentives to curtail demand and reduce load during peak periods in response to system reliability or market conditions
<table>
<thead>
<tr>
<th>Energy Efficiency Funds &amp; Demand Response Programs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Public purpose and/or utility energy efficiency programs and demand response/load management programs</strong></td>
</tr>
<tr>
<td>Demand response/load management programs</td>
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<tr>
<td><strong>Public purpose and/or utility energy efficiency programs</strong></td>
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<tr>
<td>Distributed energy resource options available</td>
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<tr>
<td>Gas energy efficiency programs</td>
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<tr>
<td>No energy management programs</td>
</tr>
</tbody>
</table>

http://www1.eere.energy.gov/femp/program/utility/utilityman_energymanage.html
Typical UESC Offerings

**Technical Services**
- Audits
- Feasibility Studies
- Engineering & Design
- Construction & Installation

**Financial Services**
- Rebates
- Project Financing

**Performance Guarantees**

**Training**

**O&M Services**

**Project Management**
Other Typical No Cost Utility Services

- Rebates/Incentives
- Rate analysis and load management assistance
- Technical assistance and/or design review
- Commissioning
- Electronic data transfer

- Metering
- Peak shaving
- Real time pricing
- Interruptible programs
- Renewable energy
- Power quality and reliability assistance
- Web access to utility account data

Based on survey of FUPWG member utilities
Actual offerings are utility specific
UESC Project Total Capital Investment
Rate of change over time

Notes:
Investment is based on projects' capital cost.
Data was last edited on 10/16/2009 and is subject to change.

http://www1.eere.energy.gov/femp/financing/uescs_industrycommit.html
UESC Data Collection Overview*

- Total Capital Investment for Awarded Projects between 1994 and October 2009: $2.10 Billion
  - Fiscal Year 2005 Total: $117 Million
  - Fiscal Year 2006 Total: $93 Million
  - Fiscal Year 2007 Total: $72 Million

- Based on voluntary reporting from utilities and agencies
Why We Should Keep Going**

**Executive Order 13514**  
**American Recovery & Reinvestment Plan of 2009**  
**EISA of 2007**  
**DOD Act of 2007**  
**Solves facility headaches**  
**Increasing energy prices**  
**Cost effective pollution prevention**  
**Reduces pressure on local grids**

Agency Energy Performance

- EPA: 23.4%
- DOI: 17.9%
- DOC: 17.6%
- DOT: 17.3%
- HHS: 17.2%
- DHS: 19.1%
- NARA: 18.7%
- USDA: 18.2%
- ST: 17.9%
- NASA: 17.6%
- HUD: 17.3%
- DOJ: 16.2%
- DOE: 12.4%
- USPS: 12.1%
- TRSY: 11.0%
- Total Gov't: 10.1%
- DOD: 9.4%
- GSA: 8.3%
- DOL: 7.6%
- VA: 7.4%
- TVA: 6.9%
- SSA: 5.8%
- RRB: 5.8%

**FY 2007 Btu/Square Foot Reduction from FY 2003**

- % Reduction in Btu/Sq.Ft. 2003-2007
- Add'l Reduction w/ RE Purchase & Source Energy Credits
- Financed projects are paid from savings -
- No increase in government spending occurs -

- ✓ Pay a lower utility bill
- ✓ Pay the contractor
- ✓ Avoid costs

<table>
<thead>
<tr>
<th>Before</th>
<th>During</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>UESC Contract</td>
<td>UESC Contract</td>
<td>UESC Contract</td>
</tr>
</tbody>
</table>

Agency's Cash Flow ($):
- Before: E + O&M
- During: 
  - Savings
  - Contract Cost
  - Financing Debt Service
  - E+O&M Cost Savings
- After: E + O&M

- Financing: pay a lower utility bill, pay the contractor, avoid costs.
- No increase in government spending.
Reasons to Choose UESCs

- Existing authority since 1992.
- Streamline contracting effort for financed energy project.
- You already know them! - You work with a known entity
- They already know you! - Your utility has unique expertise and a knowledge of your facility
- It’s an established source – Utilities best financing rate
- Wide range of projects can be implemented
- One-Stop Shop (Turnkey projects)
Project Planning
- **Initial Audit** - Identify potential opportunities
- **Feasibility Study** - Provide in-depth assessment

Implementation
- Design and Engineering
- Construction, Performance Testing, & Project Financing

Optional Services
- Commissioning
- Measurement & Verification
- Operations & Maintenance
Considerations

- UESCs may not be available to all facilities
- Utility may be new to this type of contracting
- Contract process is not rigid
- Agency’s relationship with utility
- Contract term
UESC – Enabling Legislation
Utility Programs
Section 152(f) - Utility Incentive Programs

Agencies:

- Are *authorized and encouraged to participate* in utility programs generally available to customers
- May accept utility financial incentives, goods, and services generally available to customers
- Are encouraged to enter into negotiations with utilities to design cost effective programs to address unique needs of facilities used by agency

(Codified as 42 USC 8256, P.L. 102-486)
UESC – Enabling Legislation

Code of Federal Acquisition Regulations
FAR Part 41 - Utility Services

- Provides for GSA authority to prescribe policies and methods governing the acquisition and supply of utility services for federal agencies
- Provides GSA authority to delegate authority to specific agencies to purchase utility services
- Provides GSA authority to issue areawide contracts (AWC) for utility services within the franchised, regulated utility territory

Utility Service is defined as furnishing electricity, natural or manufactured gas, water, sewage, thermal energy, chilled water, steam, hot water, or high temperature hot water

http://www.eere.energy.gov/femp/financing_types.cfm
10 USC 2913 - Energy savings contracts and activities

- Encourages participation in gas or electric utility programs for the management of energy demand or for energy conservation
- Accept financial incentives, goods and services generally available from the utility

10 USC 2866 amended - Water Conservation Authority

- Water cost savings realized – One-half of the savings shall be used for water conservation activities as designated by DoD; One-half of the savings to be used at the installation at which the savings were realized
UESC – Resources

Enabling Documents
Details:
- Legislation and Executive actions
- Legal opinions
- Agency guidance

http://www1.eere.energy.gov/femp/pdfs/uesc_enabling_documents09.pdf

Photo: Camp Pendleton’s PV Array – UESC with SDG&E
Legal Opinions:

- DOE - Rebates - In the case of utility rebates, the rebates are essentially discounted prices for utility services and constitute refunds to the Federal Government. ...rebates can be issued directly to DOE.

- DOE – Relationship of the Anti-Deficiency to Multi-Year Contracts Under the Utility Incentive Program... - no need to obligate total estimated cost of contract, but only necessary to cover annual costs under the contract
Legal Opinions (continued):

- GSA - Authority for Extended Utility Agreements – authorized to enter contracts for terms *greater than ten years*

- GSA - Exception From The Competition-In-Contracting Act’s Full and Open Competition - Section 152’s plain language contains an express authorization for an agency to participate in DSM contracts… This language appears to provide express authority for an agency to directly approach a utility concerning DSM services,… *without the use of full and open competition*
Special Considerations – flexibility to evaluate ECMs to include alternative energy initiatives and energy reduction goals, as opposed to requiring assessment of measures based solely on economic return within 10 years to justify the investment.

2911(d): Selection of Energy Conservation Measures

- Readily available
- *Demonstrate economic return on investment*
- Consistent with energy performance goals and energy performance plan
- Supported by special considerations
Availability and use of energy cost savings

- Availability – fiscal year appropriations equal to the amount of energy cost savings, including financial benefits from shared energy contracts shall remain available until expended

- Use – one-half shall be used for the implementation of additional ECMs; one-half shall be used at the installation at which the savings were realized
Public Utility Taken Into Account

- *Allows Public Utilities to use Investment Tax Credits* (ITC) extended through December 31, 2016
  - Effective February 12, 2008
    - Applicable to:
      - Energy Efficiency
      - Combined Heat & Power Systems
      - Solar Systems
Utility Energy Services Contracts

GSA Areawide Contracts

&

Other UESC Vehicles
Utility Energy Services Contract Vehicles

- **Areawide Contract (AWC)**
  - GSA / Utility Contract for utility services
  - Agency Task Order for energy management services

- **Separate Contract or Stand Alone Contract**
  - Agency / Utility Contract for energy management services

- **Basic Ordering Agreement (BOA)**
  - Agency / Utility Agreement used in conjunction with an AWC or Separate Contract for energy management services

- **Interagency Agreement (IA)**
  - Agency / Agency Agreement for energy management services
Utility Service Contract – “Areawide Contract”

- Areawide Contract (AWC), generally a 10-year contract
  - AWC is an Indefinite Delivery Indefinite Quantity (IDIQ)
  - AWC is between the franchised, regulated utility and the US government through GSA
  - Agencies within the utility service territory may use it

UESC Task Order placed under the AWC will specify project Terms & Conditions for energy management services
Utility Service Contract – Separate or Stand Alone Contract

- Generally written as a one-time-use contract for energy management services between the agency and its serving utility.
- Terms & Conditions are often established using the Model Agreement Template:
  - Written by FUPWG membership
  - Intended to provide ~80% of essential Terms & Conditions
  - The signed agreement is referred to as the Master Agreement

Separate Contract includes terms and conditions, scope of work, and is generally a single UESC.
Utility Service Contract – “BOA”

- Basic Ordering Agreement (BOA), generally a multi-year agreement outlining the terms and conditions of future UESC task orders
  - BOA is between the federal agency and its serving utility to serve agency facilities within the utilities service territory

Agencies use a BOA with a Task Order under the AWC or with a Master Agreement and Stand Alone Contract for energy management services
Interagency Agreement for Energy Management Services

- Bonneville Power Administration (BPA)
  - Provides energy management services to their federal customers within their service territory

Agencies use interagency agreements to request and pay for work done by another agency including energy management services.
UESC - Vehicles

Use of the Areawide
Quick and easy method for procuring energy and DSM services
Well-established and successful track record
Easy way to accelerate project schedules
GSA and FEMP can help
FAR Part 41 – Utility Services Contracts – GSA places a blanket contract for utility services

Agency can place a UESC Task Order directly under the AWC

or

Utility and Agency can negotiate detailed site-specific terms and conditions

Agency and Utility can use the Model Agreement as the template for the Master Agreement
1. The ECMs must reduce energy or water consumption or demand;
2. The ECMs must be directly related to energy or water use or demand reduction;
3. The majority of work must be for 1 or 2; and,
4. The ECMs must be an improvement to real property (land and buildings and anything firmly attached and integrated; not personal property)
● Energy Management Services Authorization (EMSA)
  – Nature of Service
  – Estimated Project Cost, Capital Cost, % of Cost Financed
  – Rebate Amount (if applicable)
  – Simple Payback
  – Accounting and Appropriation Data
  – Energy Conservation Measures
  – Signed by Agency and Utility
UESC - Vehicles

Separate or Stand Alone Contract
FAR Part 41.205 - any agency can place a separate contract *in the absence of an areawide contract*

- Agency / serving utility develop terms & conditions
- The model agreement template is often used to create a “Master Agreement” establishing site specific terms & conditions for energy management services

Agency and Utility can use the Model Agreement as the template for a site specific contract
UESC - Vehicles

Basic Ordering Agreement
FAR Part 16 - Service Contract, establishes terms & conditions *for future contracts*

- Agency places BOA with utility to establish terms & conditions
- BOAs are used in conjunction with AWCs and separate contracts
- Task Orders are placed under the AWC or the separate contract

Agencies and Utilities use the Model Agreement template to define the terms & conditions of the BOA
UESC - Vehichles

Interagency Agreement
FAR Part 41.206 – agencies can request and pay for services from other government agencies using “Interagency Agreements”

- Bonneville Power Association (BPA)
  - BPA provides UESCs to their federal customers
  - Limited to BPA’s service territory

Agencies use interagency agreements to request and pay for work done by another agency including energy management services
Why we need to finance projects: Allows for needed infrastructure improvements without increasingly scarce direct appropriations

Financing resources:
- Utility Energy Service Contracts (UESC)
- Energy Savings Performance Contracts (ESPC)

“Choosing a Financing Vehicle for Energy Efficiency Projects for Federal Sites”
http://www1.eere.energy.gov/femp/docs/choosing_financing.doc
OMB Recommendations to Improve Alternative Financed Projects

- Encourage all agencies to utilize experienced Project Facilitators on their projects.
  - Explore all avenues to help agencies reduce the time from kickoff to an operating project.

- Reduce financing costs
  - Agencies to verify reasonableness of financing offer
  - Agencies to verify pricing is in line with direct-funded projects

- Streamline administration of follow-up services (M&V, O&M, R&R) during the performance period to ensure savings persistence.
Utility Energy Services Contracts Planning
FEMP Project Facilitators

- Guide agency teams through project implementation
- Provide technical & procurement assistance at various levels of involvement:
  - Partnership Building
  - Advise and Consult
  - In-depth Support
Technical & procurement assistance for energy and water projects

- UESC Workshops
- Build partnerships
- Contracting expertise
- Technical review
- Process improvement
DOE FEMP Sponsored Resources

* UESC Project Workshops

* UESC Webpage

http://www1.eere.energy.gov/femp/financing/uescs.html

* UESC Enabling Documents & Training DVD

* FEMP supported conference calls & web-training
Put your team together early
- To ensure project buy-in and support
- To reduce turn-around time for approvals
- To expedite the procurement process
- To keep each other informed of current and future agency plans that impact the project

Prepare for team turnover
- Document your process
- Capture institutional knowledge
- Understand the process
- Gain support from management & staff
- Identify energy & water efficiency site needs
- Clarify expectations
- Site decision maker
- Technical staff
- Procurement personnel
- Legal rep.
- Budget rep.
- Environmental specialist

- Tenants
- Operations staff
- Maintenance personnel
- FEMP Project Facilitator (optional)
- Utility rep
- Security
- Other?
Identify Project Goals

- Solve existing energy or water related problems
- Implement infrastructure improvements
- Reduce utility costs
- Save energy

What else?
Consider Project Parameters

Facility Type + Technologies + Contract Term Restrictions

- Required ECMs
- Potential ECMs

Share these with utility partner
The UESC Process

**Planning**
- Educate Acquisition Team
- Determine Contract Vehicle

**Identification**
- Utility Audit / Initial Proposal
  - Task Order for Audit
- Feasibility Study & Agency Review / Estimate
  - Develop Contract / Establish Terms & Conditions

**Implementation**
- Engineering & Design Package
  - Develop Contract / Establish Terms & Conditions
- Construction, Installation, and Proof of Performance
  - Final Contract
UESC - Planning
Utility Audit & Initial Proposal
● Contact utility
  – What utility services are being offered to key customers?
  – What can be expected during and as a result of the audit?
  – What will the audit cost?
● Gain concurrence
  – acquisition team & decision makers
● Request the audit – Document the request

**Agreement for Audit**

Audit Statement of Work

______________ (“Agency”) hereby requests the __________ Utility Company (“the Company”) to perform an audit of the facility designated in the Master Agreement attached hereto, in accordance with the specifications contained in the terms and conditions of the Utility Services Contract (or GSA Areawide Contract), contract should include energy services subject to FAR Part 41.205, dated __________ by and between the Company and the United States of America (“the Agreement”).
# Clarify Expectations of Report Content

Ask for what you need and want right up front

## Table 1 – Energy Conservation Measures Analyzed

<table>
<thead>
<tr>
<th>#</th>
<th>Measure</th>
<th>Electric Consumption Savings (kWh/yr)</th>
<th>Gas Consumption Savings (therms/yr)</th>
<th>Total Energy Consumption Savings (MMBtu/yr)</th>
<th>Total Monetary Savings ($/yr)</th>
<th>Estimated Implementation Cost ($)</th>
<th>Simple Payback Period (yrs)</th>
<th>Savings to Investment Ratio</th>
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<tbody>
<tr>
<td>1</td>
<td>Lighting Controls</td>
<td>637,098</td>
<td>-15,058</td>
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<td>Lighting Retrofit</td>
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<td>Premium Eff. Air Compressor Motor</td>
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<td>6</td>
<td>Fix Economizers</td>
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<td>Convert AHUs to VAV</td>
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<td>56,065</td>
<td>378,802</td>
<td>6.8</td>
<td>2.2</td>
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<td>8</td>
<td>Chiller Replacement and Consolidation</td>
<td>1,635,662</td>
<td>0</td>
<td>5,583</td>
<td>67,763</td>
<td>716,475</td>
<td>10.6</td>
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<td>9</td>
<td>Window Retrofit</td>
<td>471,198</td>
<td>36,908</td>
<td>5,299</td>
<td>29,384</td>
<td>679,215</td>
<td>23.1</td>
<td>0.7</td>
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<td>10</td>
<td>Replace Existing Chillers</td>
<td>382,394</td>
<td>0</td>
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<td>11</td>
<td>Central Utility Plant (CUP)</td>
<td>1,635,662</td>
<td>0</td>
<td>5,583</td>
<td>67,763</td>
<td>3,420,310</td>
<td>50.5</td>
<td>0.3</td>
</tr>
<tr>
<td>A1</td>
<td>All Measures (1 through 8)*</td>
<td>5,200,456</td>
<td>220,134</td>
<td>39,763</td>
<td>274,274</td>
<td>1,966,813</td>
<td>7.2</td>
<td>2.2</td>
</tr>
</tbody>
</table>

*Only measures 1-8 were recommended, based on cost-effectiveness*
## Get Your GHG Information

### Table 3 – Annual Reduction in Greenhouse Gases due to Proposed ECMs

<table>
<thead>
<tr>
<th>#</th>
<th>Measure</th>
<th>Electricity Related</th>
<th>Natural Gas Related</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Reduced CO₂ (Lb)</td>
<td>Reduced SO₂ (Lb)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Lighting Controls</td>
<td>4,464</td>
<td>4,048</td>
</tr>
<tr>
<td>2</td>
<td>Lighting Retrofit</td>
<td>8,034</td>
<td>7,286</td>
</tr>
<tr>
<td>3</td>
<td>Premium Eff. Air Compressor Motor</td>
<td>145</td>
<td>131</td>
</tr>
<tr>
<td>4</td>
<td>System Scheduling (EMS)</td>
<td>1,629</td>
<td>1,478</td>
</tr>
<tr>
<td>5</td>
<td>Control OA fraction</td>
<td>-1,519</td>
<td>-1,378</td>
</tr>
<tr>
<td>6</td>
<td>Fix Economizers</td>
<td>4,159</td>
<td>3,772</td>
</tr>
<tr>
<td>7</td>
<td>Convert AHUs to VAV</td>
<td>9,592</td>
<td>8,699</td>
</tr>
<tr>
<td>8</td>
<td>Chiller Replacement and Consolidation</td>
<td>11,460</td>
<td>10,394</td>
</tr>
<tr>
<td>A1</td>
<td>All Measures (1 through 8)</td>
<td>36,435</td>
<td>33,046</td>
</tr>
</tbody>
</table>
Audit Request

Document audit expectations
Indicate the cost and designate the COTR

After agreeing on expectations, schedule kick-off meeting & walk through
Include utility, acquisition team and other essential facility staff
Notify tenants in advance

Table 4 – Recommended Water Conservation Opportunities

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Total Cost</th>
<th>Annual Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Installation of Automatic Faucets</td>
<td>66</td>
<td>$21,780</td>
<td>$79,001, $32,264, $9,811</td>
</tr>
<tr>
<td>Installation of Faucet Aerators</td>
<td>13</td>
<td>$169</td>
<td>$20, $8, $2</td>
</tr>
<tr>
<td>Boiler Blowdown Optimization</td>
<td>4</td>
<td>$24,000</td>
<td>$250, $1,232, $54</td>
</tr>
</tbody>
</table>

Table 5 – Cost-Effective Renewable Energy Opportunities

<table>
<thead>
<tr>
<th>Renewable Energy Measure</th>
<th>Total Capital Cost</th>
<th>Total Energy Cost Savings</th>
<th>Savings to Investment Ratio</th>
<th>Simple Payback Period (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lighting Controls</td>
<td>$53,800</td>
<td>$10,070</td>
<td>3.0</td>
<td>5.3</td>
</tr>
<tr>
<td>Solar Ventilation Preheat</td>
<td>$233,333</td>
<td>$8,831</td>
<td>0.6</td>
<td>26.4</td>
</tr>
<tr>
<td>Facility Level Wind Generation</td>
<td>$1,089,000</td>
<td>$81,208</td>
<td>1.2</td>
<td>13.4</td>
</tr>
</tbody>
</table>
Provide Facility Data

- 2 years of utility data (including water)
- Current building use & equipment data
- Anticipated facility & utility use changes
- Previous audit information
The partnership begins here
- Provide facility data, drawings, studies, future construction plans, …
- Clarify site needs & constraints
- Provide knowledgeable staff

Remember: Success depends on open communication

Saving the utility time collecting essential data ultimately saves the government money
Before the walkthrough,
  – the utility will review consumption & costs
  – should evaluate rate schedule options

During the walkthrough,
  – the utility team will observe operations, use & conditions of buildings & systems

After the walkthrough
  – anticipate follow up calls
  – and visits as needed

The utility team will want to discuss O&M procedures & concerns related to energy consuming systems
Establishes baseline *(should be agreed upon)*
- building type, conditions & use
- equipment specs, conditions, & use

Describes recommended ECMs, project management & performance plans

Offers a preliminary estimate of costs and savings
- Energy use
- Installed cost
- Available incentives
- Simple payback
Review the audit report

- Are assumptions, analyses and calculations clear and credible?
- Does it provide solutions to site problems?
- Are requested measures included?

Consider which recommendations are suitable

Consider the utility’s technical ability and compatibility

- Utility may partner with expert for specific technologies

Evaluating Audit: Look for issues that affect mission, feasibility & economics

Keep in mind: the feasibility study will provide more detail and accuracy
Is this a good fit for a continued partnership?

You make the call……

– Will you say thank you and go separate ways?
– Will you negotiate revisions and move forward to the feasibility study?
UESC - Planning
Feasibility Study &
Detailed Proposal
Feasibility Study

Definition

A feasibility study is an investment grade analysis of the site’s condition and potential efficiency improvements, including a detailed presentation of both the technical and economic viability of the proposed ECMS.

Approximately $0.1 – 0.2 per square foot
Finalize Facility Considerations

- Facility configuration
- Back-up systems
- Available in-house resources
- Union concerns
- Work environment
- Related support needs
Finalize ECM Selection

- HVAC equipment, controls, & distribution
- Lighting
- Energy management and control systems
- Advanced metering
- Renewable energy systems
- Commissioning
- Water heating systems
  (include solar hot water where feasible per EISA)
What the Feasibility Study Should Include

Technical

- **Finalized baseline** - buildings and energy consuming equipment & systems
  - Conditioned space & use
  - Hours of use ~ occupancy
  - Loads, conditions, & operating schedules of equipment & systems

- **Recommended Measures**
  - Detailed description, cut-sheets & schematics
  - Assumptions
  - Interplay between measures
  - Estimated energy, cost & maintenance savings with calculations
  - Estimated implementation costs
  - Method of verifying savings
  - Commissioning plan
  - O&M ~ start up and on-going requirements
  - Environmental benefits ~ CO2, SO2 & NOx
  - Environmental actions ~ ballast disposal

LCC analysis
What the Feasibility Study Should Include

Price

- **Detailed cost estimate**
  - Labor
  - Rental equipment
  - Materials
  - Subcontracts
  - Taxes
  - Engineering services
  - Project management costs
  - Performance bond
  - Overhead rate
  - Authorized profit

- **Rebates & incentives**
  - Provide process of application, assignment and acceptance

- **Itemized costs**
  - M&V
  - O&M
  - Commissioning
  - Guarantee for performance or savings
Evaluating the Study

- Inclusion of requested ECMs
- Reasonable savings calculations
- Reasonable baseline
- Reasonable assumptions and interaction of ECMs
- Inclusion of ECMs for water and renewables
- Adequate consideration of site-specific issues
- Adequate consideration of environmental benefits & issues
- Reasonable Price
- Reasonable financing rate & contract term
- Do savings exceed payments?
- Are the proposed measures fuel neutral?
Did the Utility
- Identify and use the best rate schedule when calculating savings?
- Consider early ECM payoffs and financial impacts?

Did the Agency
- Do an “independent cost estimate”?
  - Use cost estimating handbooks and past experience to analyze the project implementation costs
- Consider level of competition among subcontractors?
- Examine adders: project management, hourly rate, OH and profit (both % and basis), taxes?
UESC – Implementation
Engineering & Design
&
Construction & Performance Testing
Although we show this step separate from construction; it is more often combined

TASK ORDER For Engineering & Design
Statement of Work

Recommendations Approved for Engineering & Design
Statement of Work Specifications

Confirm the Scope of Work

Confirm the Cost

Sign Task Order
The results of this phase should be 100% design, plans & specifications and a detailed price proposal consistent with the Feasibility Study.

The design package should include:

- Plans for Commissioning, Performance Verification, and continued effective O&M
- A final price proposal
- A construction schedule w/ planned service interruptions, environmental compliance, quality control, and ECM installation sequence

FEMP provides technical assistance with proposal and design reviews, advice on technologies and help resolving contracting questions and concerns.
Commissioning Objectives - Design with a focus on commissioning and continued effective maintenance

- Optimize equipment and control systems
- Support effective O&M with training, documentation, and maintenance strategies that maintain and/or improve energy efficiency

Develop a Commissioning Plan

- Include specific actions for commissioning during construction, acceptance and post acceptance
- Address commissioning for each recommendation and interactions between recommendations and existing systems

Develop “design and operating intent” early in the process (Feasibility kick-off meeting)
The feasibility study results or final proposal becomes the SOW for the Construction phase

Review – Discuss – Agree on ECMs – Negotiate costs

Pay – or - Roll
AGREEMENT FOR CONSTRUCTION TASK ORDER

__________________________ (“Agency”) hereby requests the ________________ Utility Company (“the Company”) to proceed with construction for the facility designated in the Master Agreement attached hereto, in accordance with the specifications contained the terms and conditions of the Utility Services Contract (or GSA Areawide Contract), contract should include energy services subject to FAR Part 41.205, dated ___________ by and between the Company and the United States of America (“the Agreement”).

Construction - for each approved recommendation designated
Initiate Project Construction and Installation

- CO issues task order for Construction & Installation Phase
- Pre-construction meeting
  - The COTR and facilities/engineering staff and utility reps review and coordinate project schedule, installation & inspection
  - Work with inspection and implementation site personnel to approve the final construction schedule
Final Construction Package

- Plans & Specifications
- Final Performance Verification Plan
- Final Commissioning Plan
- Final Training Plan
- Equipment submittals
- Construction schedule

What else would you like to see?

Payment & Performance Bonds
After approval of ECM installation plans, the utility shall submit Payment & Performance Bonds or a “Letter of Credit”
The agency monitors the construction to assure work is proceeding as planned.

The utility must notify the agency when each ECM is ready for testing and performance verification.
Overarching Objectives of Commissioning

- Provide a clear definition of performance goals
- Perform work properly the first time
- Provide clear assignment of responsibility
- Verify completion
- Review operations after installation is complete

Commissioning can save considerable amounts of energy; even after energy-savings retrofits have been implemented

- Identify and remedy problems
- Optimize component & systems

Examples: simultaneous heating and cooling, frozen valves, stuck dampers, fouled filters, over-ridden or malfunctioning variable speed drives, sub-optimized temperature controls, and excessive equipment cycling
- O&M manuals for installed ECMs
- Performance/Testing / Commissioning results
- Inventory of spare parts (lamps, ballasts)
- As-built drawings
- Training manuals
- Warranties (including date at beneficial use)
- Davis-Bacon wage rates
- Performance bonds on subcontractors
- Letter of credit from utility
Per contract requirements, the utility notifies the agency of project completion

- Agency deems
  - Substantial completion/beneficial occupancy
  - Final completion and acceptance
  - Completion of punchlist

The agency notifies the utility of project acceptance in writing

The government must verify that installation & performance meets the design intent
Include hands-on operation of new equipment:
- start-up, operation in normal and emergency modes, shutdown procedures, seasonal changeover, and manual/automatic control
- Energy Management and Control System sequencing, strategies, operation and programming

Provide periodic training over the contract term

Training documentation should include:
- Video tape of the training sessions
- O&M manuals for new equipment
- Routine maintenance requirements and schedules
- Health and safety issues and concerns
- When and how to re-commission
Utility Energy Services Contracts

Contract Development
Language developed by Edison Electric Institute, technical, legal & contracting officers from DOD, DOE and other agencies

Reviewed and approved by public and private authorities

Includes ~80% of terms & conditions for UESC

Provides language used successfully many times
AGREEMENT FOR ENERGY CONSERVATION AND DEMAND SIDE MANAGEMENT SERVICES 
BETWEEN 
THE UNITED STATES OF AMERICA 
AND 
_________________ UTILITY COMPANY

This Agreement for implementation of Energy Conservation Measures (ECMs) is entered into this _____ day of ______, 200_, by and between ___________________ Utility Company (Utility) and the United States of America (Government), represented by the Contracting Officer executing this Agreement. The signatories to this Agreement will be sometimes collectively referred to as the “Parties” and individually as a “Party.” This Agreement (when signed by the Parties), any Task Orders (T.O.) executed pursuant to this Agreement, and any other associated agreements shall constitute the entire Contract between the Parties with respect to a particular ECM. A term or condition contained in this Agreement may be amended at any time by mutual written agreement of the Parties. However, termination, modification, or expiration of a term or condition shall not retroactively affect T.O.s previously entered into under this Agreement.

The Parties agree to the following principles, concepts and procedures:

GENERAL CONDITIONS

GC.1 Purpose. The Government desires assistance in accomplishing ECMs at _____________________ Installation (“Installation”) (may substitute “at all Installations within the Utility Company’s service area, to include [list the installations by name] (“hereinafter, “Installations”)). The purpose of this Agreement is to facilitate the implementation of ECMs through T.O.s. This Agreement sets forth the terms and conditions under which subsequent T.O.s may be entered into between the Parties.

GC.2 Definitions. Terms used in this Agreement
Most UESCs are a combination construction/service contract. Utilization of FAR clauses is dependent on type of work:

- Determined by project specs and CO (some Navy C.O.’s consider contracts to be pure construction)
- For project’s design activities and performance phase activities (O&M, M&V), use FAR clauses for services, including supplemental clauses for A/E services
- For project’s installation activities, use FAR clauses for construction.
Wages and rates
- Davis Bacon rates for construction, Service Contract Act rates for services (except A/E design services)

Warranty
- FAR 52.246-20 for construction, FAR 52.246-21 for services

Payment and performance bonds
- Requirements determined by CO,
  utility letter of credit is low cost option
- FAR 28.102 or 52.228-15 for construction, FAR 28.103 or 52.228-16 for services
General Conditions
Warranties & Remedies
Financing and Payment Provisions
Special Requirements

Model Agreement & Explanations
http://www1.eere.energy.gov/femp/docs/civagree.doc
http://www1.eere.energy.gov/femp/pdfs/civexplan.pdf
Utility Energy Services Contracts

Financing Overview
Role of Financial Institution

- Necessary in most projects
- Provides specialized construction & permanent financing
- Offers non-recourse financing
- Works with Prime Contractor (Utility) and the Agency
- Prepares documentation
- Terminology Website: www.investopedia.com
How do Financiers Assess and Price Project Risks and Costs?

- Evaluate Strength of ESCO or Utility
- Evaluate Economics, Technologies and the Extent of the Energy Savings Guarantee
- Evaluate the Contract’s Termination Language
  - Termination Schedule
- Size of Financing
- Term of Financing
Selecting Financing Solutions

- Most ESCO/utilities use financial institutions
- Select qualified prime contractors
- Talk to financial institutions
- Use agency resources in analysis
- Ask for alternative structures
- Be flexible on documentation
- Require strong letters of commitment
- Consider the financial risks
Why Interest Rates Vary

- Performance Risk
  - Project Construction
  - Energy Savings Guarantee
  - Ongoing O&M

- Contract Administration

- Project Requirements
  - Term and Size of Financing
  - Fixed or Variable Rates
  - Additional Financing Fees
Interest rate is determined by:
- Base rate relative to market rate (Treasury Note or SWAP rate)
- Increases for contract terms/risks (adder)

Escrow accounts are the main type of financing structure used during construction.

Ultimately, pricing and terms are set by comparing a project’s overall risk and return to similar projects in the private sector.
Components of the Interest Rate

- **Base Rate**
  - Currently based on Treasury Note rate or SWAP rate for payment term and mode of the contract
  - The Treasury Note rate is less volatile

- **Spread**
  - Basis points (1/100% or .01%) added as a result of lender’s perception of project’s risk
  - Contributing elements include participant risk (utility/customer), project risk, market dynamics and contract risk (financed amount and term, payment mode and frequency, and other terms/conditions)

(Spread is the difference between the bid and ask prices for a particular security. A large spread often indicates inactive trading of the security)
<table>
<thead>
<tr>
<th>Component</th>
<th>Treasury Note*</th>
<th>SWAP*</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-Year Base Rate</td>
<td>3.68%</td>
<td>4.04%</td>
</tr>
<tr>
<td>Spread</td>
<td>4.00%</td>
<td>3.75%</td>
</tr>
<tr>
<td>Total</td>
<td>7.68%</td>
<td>7.79%</td>
</tr>
</tbody>
</table>

Websites for rates:

**Treasury Rates:**

**SWAP Rates:**

*An Example Only – Not Representative of Actual Rates*
Escrow Financing Example

Assumptions

- Interest Rate: 6.72%
- Draw Total: $10,000,000
- Capitalized Finance Charges: $552,577
- Total Amount Financed: $10,552,577
- Monthly Payments: $121,007
- Payment Term (in months): 120
- Total Annual Payments: $1,452,084
- Total Payments: $14,520,840

Payment Mode Comparison

- 10 Annual-in-Advance Payments: $1,408,424
- Total AIA Payments: $14,084,240
- Total Payment Mode Savings: $436,600
Utility Energy Services Contracts

Things to Consider &

Closing Remarks
How to Get the Lowest Interest Rates

- Bundle Projects
- Keep the Financing Term Under 15 Years
- Insure the Government Contract has Desirable Termination Language
- Fix Interest Rates at Time of Award
- Provide Limited or No Energy Savings Guarantees
- Work Only with Companies with the Very Highest Credit Ratings
- Don’t Include Other Financing Fees in Rate
Use GSA and FEMP for advice and support, briefings to project teams and management

Find background information on web sites:
- www.eere.energy.gov/femp/utility.html
- http://gsa.gov/pbs/xu/

See the UESC online video from FEMP that showcases this process
Any delay in project implementation results in loss of life cycle savings.
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