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

Alternative Financing Options for Energy Projects

June 29th, 2010

FEMP
Federal Energy Management Program

Webinar Agenda

- Introduction
- Energy Savings Performance Contracts
- Questions and Answers
- Power Purchase Agreements, first half
- Short break
- Power Purchase Agreements, second half
- Utility Energy Service Contracts
- Questions and Answers

- **PLEASE MUTE YOUR PHONES! Thank you.**

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The Department of Energy's Federal Energy Management Program's (FEMP) mission is to facilitate the Federal Government's implementation of sound, cost-effective energy management and investment practices to enhance the nation's energy security and environmental stewardship. FEMP provides assistance through project transaction services, applied technology services, and decisions support services.

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ESPC

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Joyce Ziesler

Definitions

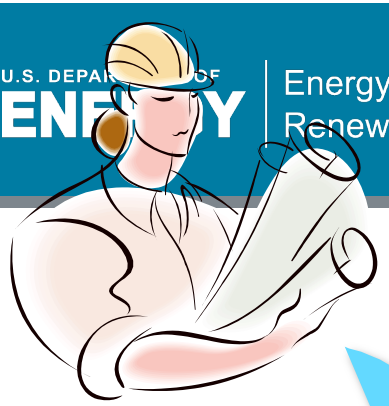
- ESPCs are contracts that allow agencies to procure facility improvements with no up-front capital cost and without special appropriations from Congress.

- An energy service company (ESCO)
  - Incurs the cost of developing and implementing the energy project
  - Guarantees a specified level of cost savings

- The customer (agency/site)
  - Pays the ESCO over the term of the contract out of the energy and energy-related (operations & maintenance) savings resulting from the project

Where the Money Comes from and Where it Goes

Energy Efficiency & Renewable Energy



Agency Energy and O&M Bills

Cost Savings

Savings repay ESCO

ESCO pays for project (with financing)

Improvements create savings

Appropriations for Energy and Related O&M

Key Points about Federal ESPCs

- Savings guarantees are mandatory
  - Energy and water cost savings
  - Energy- (and water-) related cost savings
- Savings must exceed payments in each year
- Measurement and verification (M&V) is mandatory
- Contract term cannot exceed 25 years

YES, ESPCs ARE LEGAL

- Authorities:
  - National Energy Conservation Policy Act (42 USC 8287), Title VIII Shared Energy Savings (1986)
  - Energy Policy Act (EPACT), Public Law 102-486 (1992)
  - DoD Authorization Act FY05, Public Law 108-375 (2004)
  - Energy Policy Act of 2005
  - Energy Independence and Security Act of 2007 (H.R. 6 ENR) – permanent reauthorization (Sec. 514)
- Precedents:
  - 1st federal projects in mid-'90s
  - Super ESPCs: 11 years, 200+ projects

Super ESPC

- Super ESPCs are indefinite-delivery, indefinite-quantity (IDIQ) contracts awarded competitively to ESCOs by DOE-FEMP
  - IDIQ defined in Federal Acquisition Regulations (FAR)
  - Agencies award task orders (TOs) for energy projects under the Super ESPCs (as under any multi-award contract)
  - WHY? To streamline and make as cost-effective as possible the use of ESPC by federal agencies
- Other approaches
  - Stand-alone or individual contracts
    - Business as usual – Synopsis, solicitation, etc.
    - Substantial agency effort required
  - Other federal ESPC vehicles
    - Army Corps
    - GSA Schedule

Super ESPC Contract Scope

- Federally owned facilities worldwide
- Technologies – list of 20 categories in IDIQ attachment J-3
  - Everything from exit signs to industrial boilers
  - Must save money from energy or water bills, or energy-related operations & maintenance
    - Measures that reduce demand only (kW) (e.g., thermal storage) acceptable and encouraged
  - Last category is “Future ECMs”

Super ESPC Process, Phase 1 – 5

- Phase 1: Aquisition Planning
- Phase 2: Preliminary Assessment / ESCO Selection
- Phase 3: Negotiation and Award of Task Order
- Phase 4: Design and Construction, Project Acceptance
- Phase 5: Performance Period

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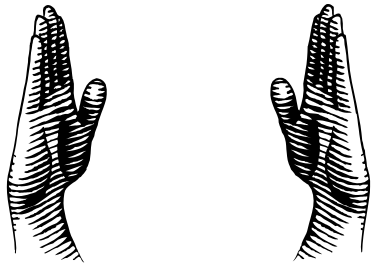
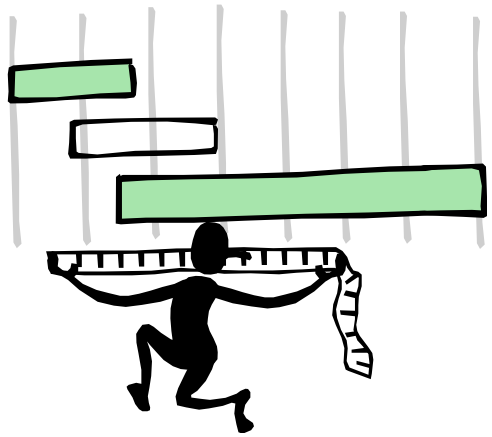
Introduction to Measurement & Verification in Super ESPCs



Why do you need M&V?



- Savings guarantees are contractually and legally required
- But guarantees are only as good as the M&V behind them
- M&V verifies that guarantees are being met
- M&V helps to allocate risk and identify problems

"What you don't measure, you can't manage."
—Jack Welch, former GE CEO

Basic M&V Concepts

- M&V methods should balance savings assurance against added cost
- If M&V plan is weak, guarantee will be met only on paper
- 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 generally require ESCOs to measure key performance parameters of ECMs

Options A, B, C, and D

- Each ECM is assigned an M&V option: A, B, C, or D
- Measurements of each option differ by:
  - Level – individual system vs. whole building
  - Duration – spot, short-term, periodic, continual
  - Degree of stipulation
    - For more information on stipulation in M&V, see FEMP ESPC resources
      - 2.6: Introduction to Measurement and Verification (M&V) for FEMP ESPC Projects
      - 10.1: Guidelines to FEMP M&V Option A
- Cost can range from 1-15% of project cost, average is 3%
- Options address risk allocation

Guidance on M&V

- FEMP M&V Guidelines v. 3.0
  - M&V specifically for federal energy projects
  - Application of International Performance Measurement and Verification Protocol (IPMVP)
  - Addresses M&V methods by ECM type
  - On line under #10.2 at *www1.eere.energy.gov/femp/financing/espcs_resources.html (FEMP ESPC Resources page)*

- Introduction to M&V for FEMP ESPC Projects (2.6 on FEMP Resources page)
- Other M&V guidance on FEMP ESPC Resources page: 2.5, section 6, section 8, and section 10

ESPC Process – Phase 1

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

Get started with FEMP Federal Financing Specialist	Assemble Acquisition Team	Consider project motivations and site needs

Getting Started

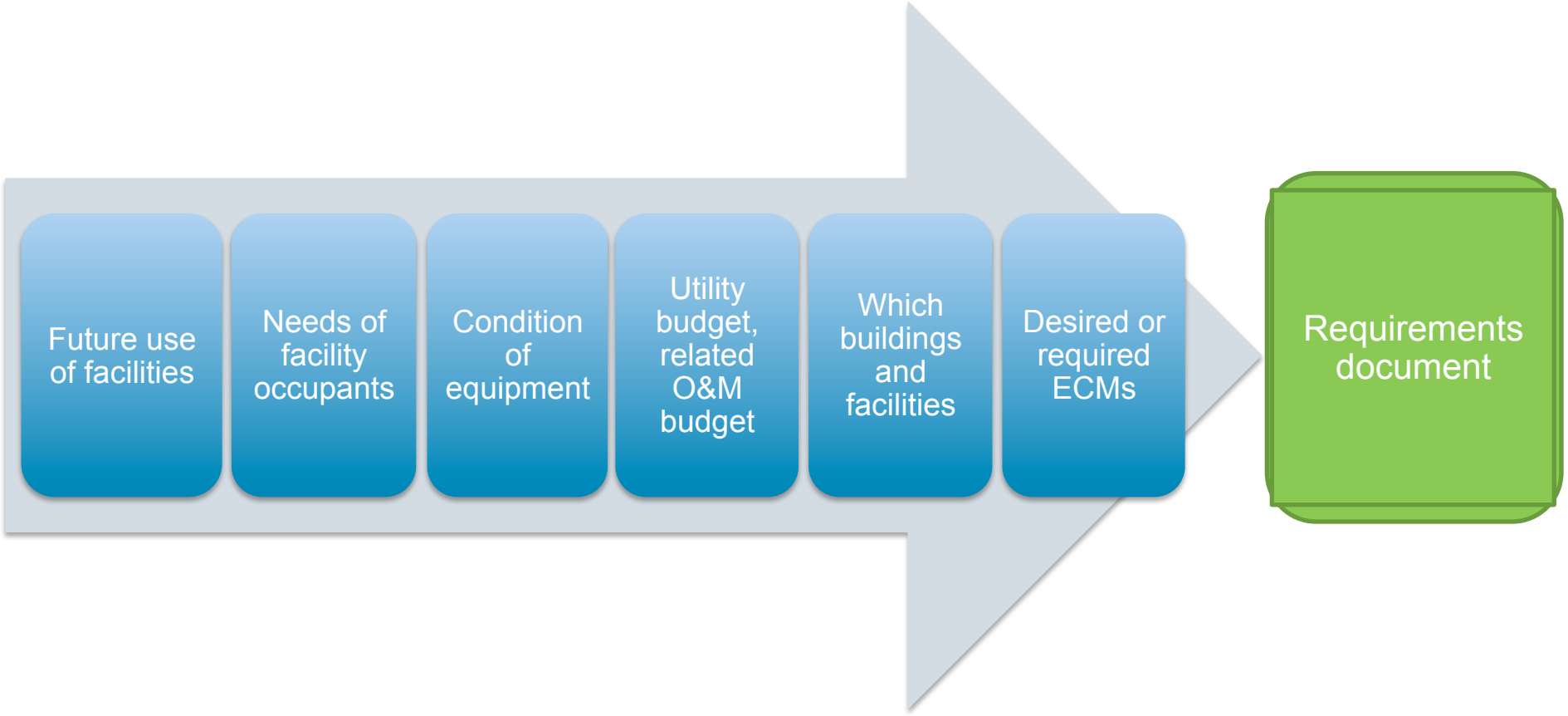
- A FEMP Federal Financing Special (FFS) will help you get started
  - Identify and educate decision makers and other staff
  - Secure the services of a DOE-qualified Project Facilitator (required) through an interagency agreement
    - Project facilitation is provided by FEMP at no cost to agency through preliminary assessment review

- Keep in mind: No one expects you to do an ESPC project without the help of FEMP's ESPC team – FFS, PF, and others

Acquisition Team

- Must include at least the agency/site contracting office and a site technical representative
- Everyone who could help or hinder (or be affected by) project should be invited
  - 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

Key Issues for Team to Address



Prepare to engage with ESCOs and direct their efforts to address your site's needs and priorities.

ESPC Process

Phase 2 – Preliminary Assessment / ESCO Selection

Review preliminary assessment (s) and ESCO qualifications	Select a winner	Issue Notice of Intent to Award

An ESPC is a long-term deal – choose a partner you can live with

Evaluating ESCO Qualifications and Past Performance

- Evaluating ESCO's qualifications
  - Review ESCOs' qualification statements: www1.eere.energy.gov/femp/financing/superespcs_espcescos.html
  - Ask for contact info for ESCOs' past customers
  - Review ESCOs' financial standing (e.g., Dunn & Bradstreet)

The Preliminary Assessment

- Must comply with IDIQ contract requirements (see section H.4) and give sufficient information for a decision
- Key elements:
  - A narrative summary of proposed project
  - Description of ECMs
  - Estimates of proposed energy and cost savings
  - M&V approach (general)
  - Risk, Responsibility and Performance Matrix
  - Financial schedules

Preliminary Assessment Review

- Is the proposed scope sufficiently comprehensive?
- Does this meet (or can it be adjusted to meet) the majority of our needs?
- Is it a good deal for the government?
  - e.g., is it an appropriate project for a performance contract?
- Can our agency and the ESCO have a good long-term partnership?
- Are ECM descriptions and projected energy savings reasonable?
- Are service-phase line items acceptable?
- Are contract term and total cost acceptable?

IF YES:

- You can accept one of the proposals and provide feedback to the ESCO
  - Feedback to address deficiencies and desired changes
  - These items to be addressed in the IGA and final proposal
- All other Preliminary Assessments are returned to the issuing ESCOs

IF NO:

- You can return all the Preliminary Assessments if none is satisfactory
  - Scrap the project, or
  - Consider starting over by issuing a revised set of requirements to the ESCOs

Phase 3: Negotiation and Award of Final Task Order

TO RFP (a Misnomer)

- Establishes site-specific requirements
  - Examples: standards of service, specifications for drawings, agency procurement contacts and procedures, handling of hazardous materials, security procedures
- Replaces or adds to IDIQ language
- Template includes clauses that are usually modified
- Supercedes (overrides) IDIQ language

- Your Project Facilitator will write a draft, in consultation with site experts

TO RFP will change some provisions, but not all

- Not all contract provisions are addressed in TO RFP, but all may be altered (see Section C.1 of IDIQ)
  - If changes are not necessary (existing IDIQ language/ requirement is acceptable), that clause will not be addressed in the TO RFP
  - Some provisions require inclusion of agency-specific information and must be addressed
  - TO RFP can be used to add requirements not addressed by IDIQ by adding provisions

The Investment Grade Audit (IGA)

- The IGA
  - Establishes the basis for the project design, guaranteed savings, and baselines
  - IGA report becomes part of the final proposal
- IGA Kickoff Meeting
  - Held on site and facilitated by Project Facilitator
  - Introductions — New staff, ESCO project developers, agency escorts
  - Establish milestones and TO award schedule
  - Review requirements for submission of final proposal
  - Review access and security procedures
  - Clarify agency/site-specific requirements
  - Establish communications protocols
  - Agency should share any new or changed information with ESCO
  - Agency facilitates site access
    - IGA will generally require multiple visits from ESCO, subs

The Final Proposal

- Integration of IDIQ, TO RFP, IGA report, and financing
- Technical portion
  - ECMs: feasibility, energy savings calculations, implementation costs, annual cost savings
  - M&V methodology and energy/O&M baselines
  - Project intent document and Commissioning Plan outline
  - Management plan, including Risk, Responsibility, and Performance Matrix
- Pricing portion
  - TO financial schedules
  - Level of supporting detail as per TO RFP
  - Financing summary

Task Order Financial Schedules

- TO-1 — Guaranteed Annual Cost Savings & Annual Contractor Payments
- TO-2 — Implementation Price for ECMs
- TO-3 — Performance-Period Cash Flow
- TO-4 — First-Year Energy & Cost Savings by ECM and Technology Category
- TO-5 — Annual Cancellation Ceiling Schedule

Award of Task Order

- TO is signed and awarded by the agency CO
- The Task Order consists of:
  - Face page
  - ESCO's final proposal, including IGA report, revised per negotiations
  - TO price schedules
  - TO RFP, revised per negotiations
  - Subcontracting plan

Phase 4: Implementation

Part 1: Review of Design and Construction Package

Post-award conference → ESCO insurance & bonds

ESCO submittals & agency approvals → Notice to proceed with construction

Part 2: Inspections, Commissioning, Acceptance

Construction → Inspections & verifications of installation, documentation, training

Commissioning

Post-Installation M&V → Acceptance of completed project

Submittals and Approvals

- Designs, plans, and schedules per TO RFP requirements
  - Design and construction package allows agency COR to verify that installation complies with contract requirements
  - ESCO's submittals constitute requirements of the contract after acceptance by agency
  - Acceptance does not relieve ESCO of design liability and standard-of-service requirements

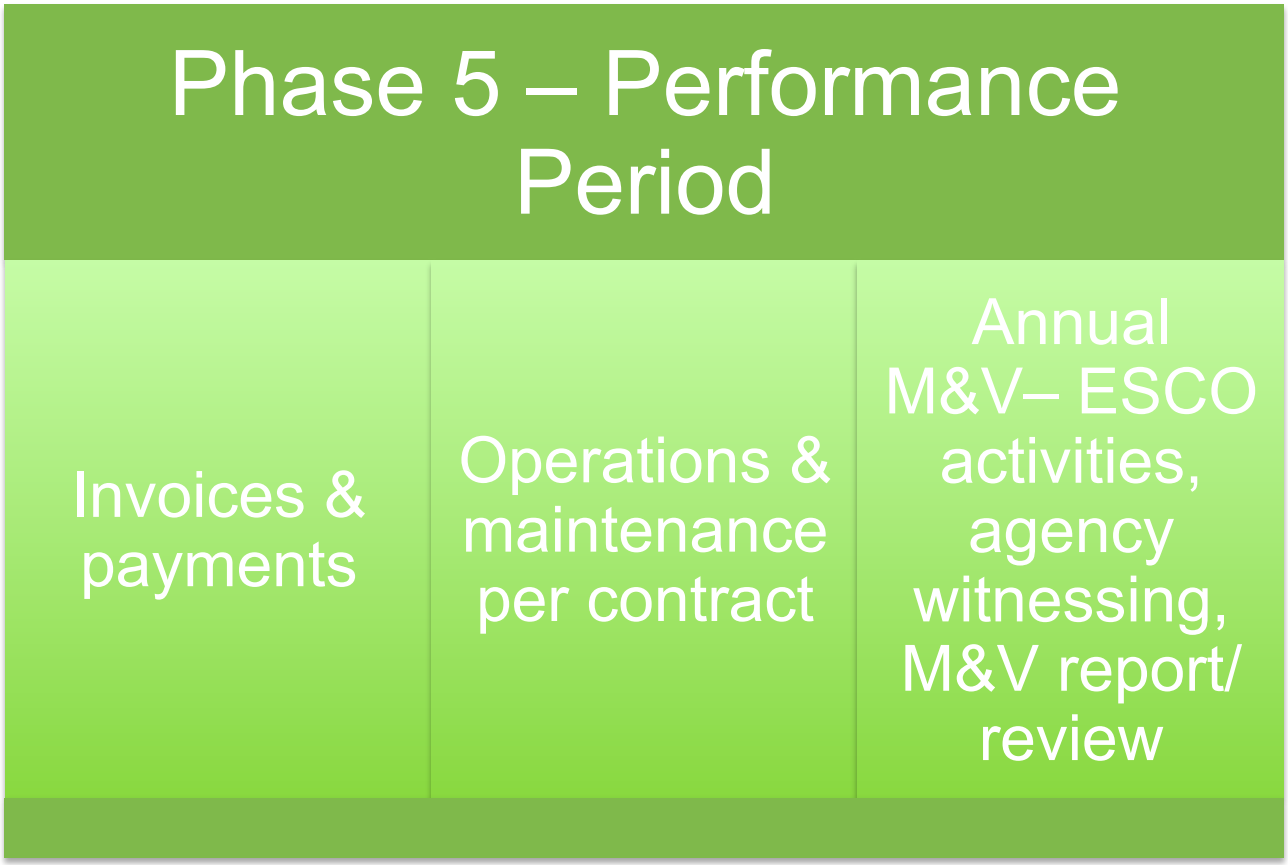
Inspection and Acceptance of Installed ECMs

- Inspections and verifications
  - Specified equipment was installed properly (Cx report)
  - M&V data confirms potential of ECMs to generate the guaranteed savings (post-installation report)
  - Other documentation (O&M manuals)
  - Required training is provided
- ESCO resolves outstanding issues and provides required documentation and training

Commissioning

- Verify and document proper installation and performance of new equipment
  - Goal of commissioning is that systems are running the way they're supposed to, e.g.:
    - Fans come on and off according to specifications
    - Temperatures are maintained according to site's stated requirements
- Mostly completed before acceptance
  - Some checks after acceptance are required, such as summer performance of chillers, steam trap performance in winter

Phase 5 – (Post-Acceptance) Performance Period



The *Agency* is responsible for ensuring that the ESCO delivers on the guarantees.

Invoices and Payments

- Invoicing begins after CO has formally accepted the installed project
- Payments are generally annual-in-advance to minimize agency interest expense
  - This is legal since project has already been installed; recourse is still available for any shortfalls discovered
  - Payments can also be monthly, annual-in-arrears, etc.
- Agency is responsible for verifying that invoices contain any required documentation of services provided before issuing payment

Typical Performance Period Services from ESCO

- Performance-period services to be performed by ESCO are detailed in the Task Order

- M&V services – required annually
- Periodic retraining of agency O&M staff
- O&M services
- Repair and replacement services

Measurement and Verification

- 13 months after installation, ESCO submits first annual M&V report. The site-specific M&V plan established:
  - Intervals for measurement (at least annual)
  - How ECM performance will be verified and savings will be calculated
  - Documentation contractor must provide during verification
- Government must review and approve M&V report

Annual Reconciliation of Energy Savings Performance

- If actual savings fall short of guaranteed savings, ESCO must reimburse government
- Government must review and inspect performance of ECMs
  - If ECMs do not meet or exceed guaranteed savings, contractor must correct deficiencies or payments will be adjusted
  - Shortfalls are reconciled in 13th month and annually thereafter

Closeout of Task Order

- Agency notifies ESCO by letter that the performance period is over and payments will cease
- ESCO transfers title and agency assumes ownership of equipment and systems (or title transfer occurs earlier)
- Agency may negotiate for continuing services from ESCO

Resources

FEMP Web Site

- ESPC home
  www1.eere.energy.gov/femp/financing/espcs.html

- ESPC success story (video)
  www1.eere.energy.gov/femp/financing/superespcs_fda.html

- ESPC resources, guidance, contract documents
  www1.eere.energy.gov/femp/financing/espcs_resources.html

- Calendar of Events (all training dates)
  http://www1.eere.energy.gov/femp/news/events.html

FEMP Federal Financing Specialists (FFS's)

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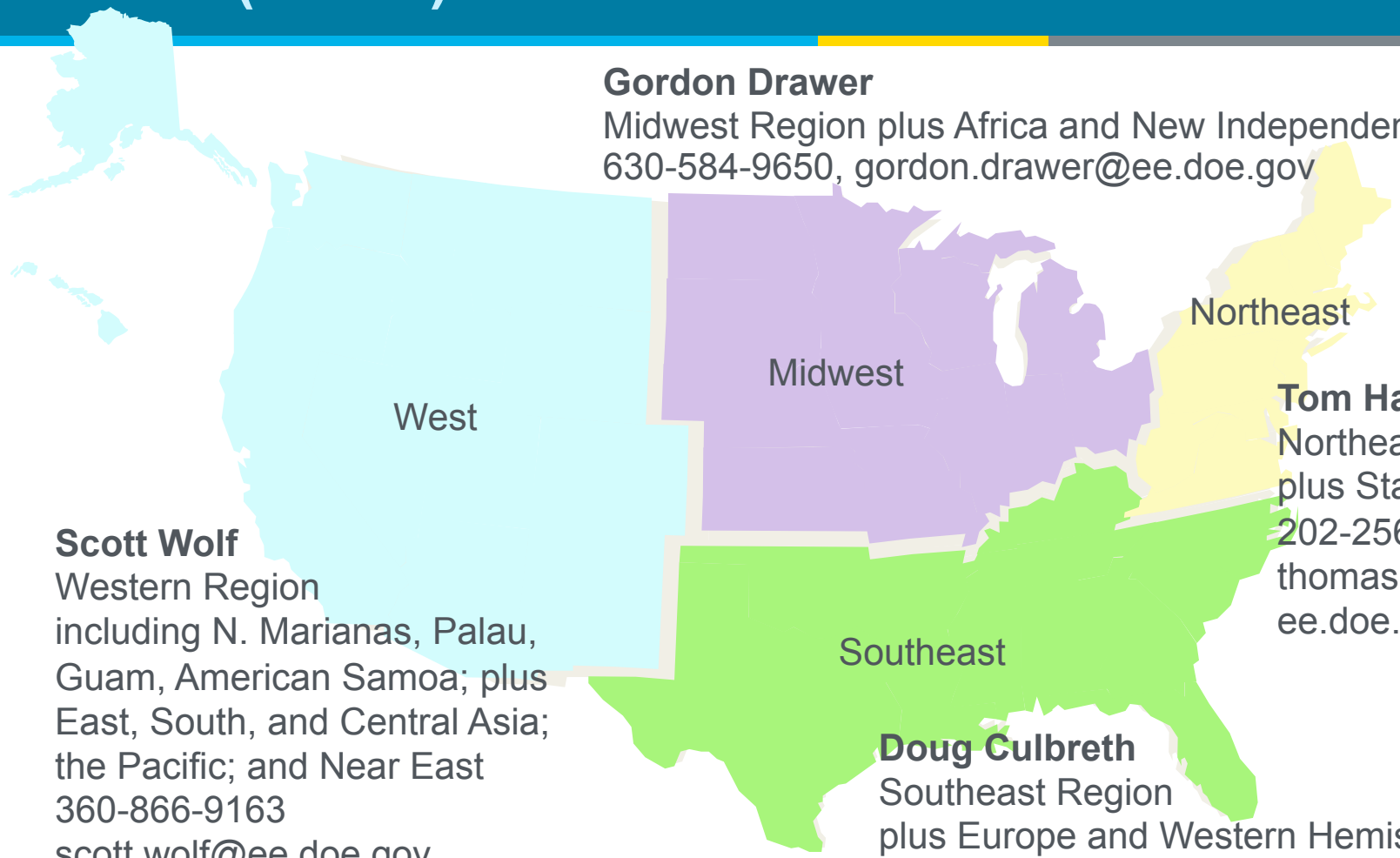

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Questions?

June 2010

Overview

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- Customer-sited power purchase agreement (PPA) definition
- Project process
- PPA hybrid options
- Project examples

Customer-Sited Power Purchase Agreement

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- Private entity installs, owns, operates and maintains customer-sited renewable equipment
- Site purchases electricity through power purchase agreement (PPA)
- Pros
  - Renewable developer (or partner) eligible for tax incentives, accelerated depreciation
  - No agency up-front capital required
  - Renewable developer provides O&M
  - Minimal risk to government
  - Known long term electricity price for portion of site load
  - On-site projects are encouraged for meeting federal renewable goal and are eligible for double bonus
    - Good alternative to purchasing renewable energy certificates (RECs)
  - Can help with energy security goals
- Cons
  - Transaction costs
  - Limited federal sector experience

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Renewable PPA Diagram

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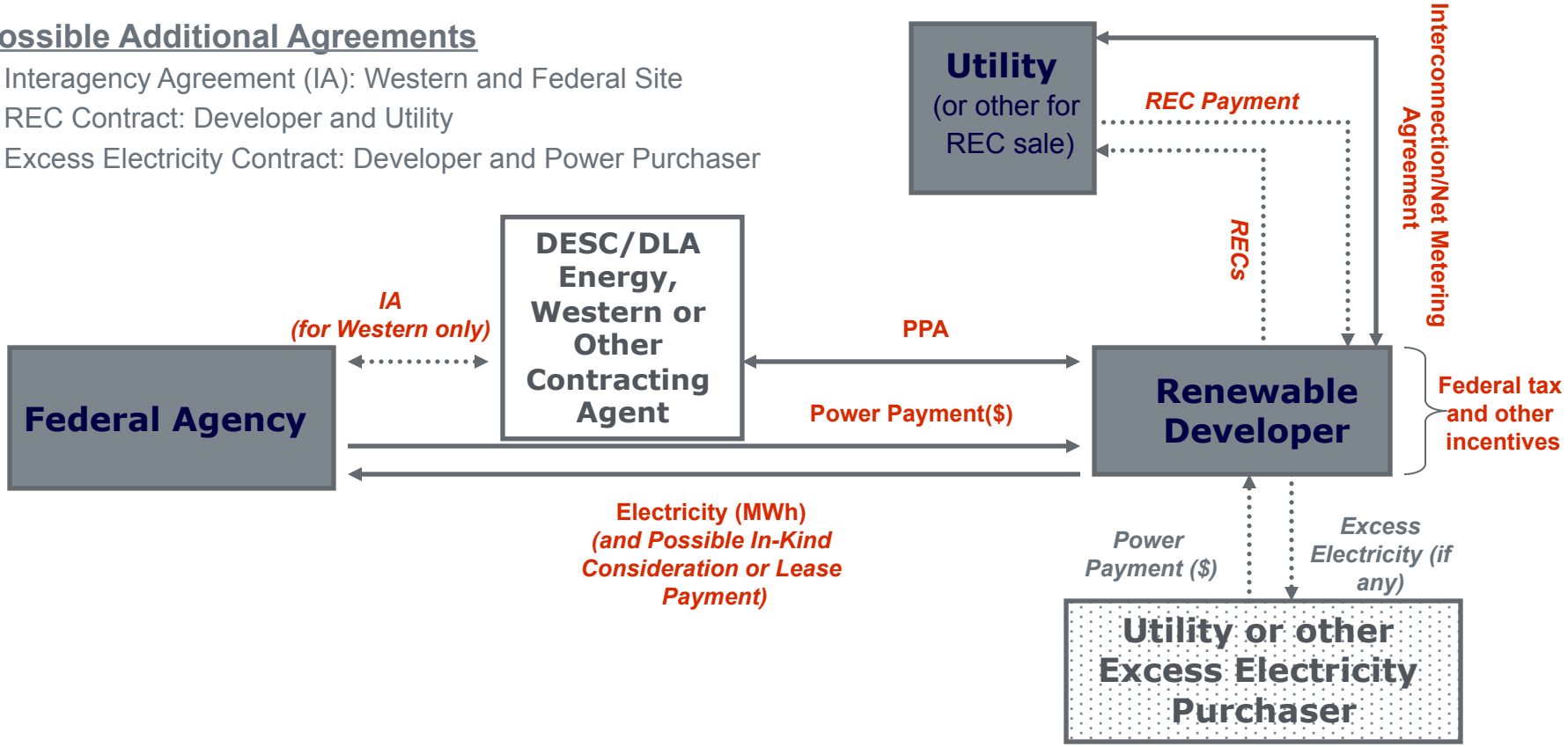
Agreements

- PPA: Federal Site, DESC/DLA Energy or Western, and Renewable Developer
- Land Use Agreement: Federal Site and Renewable Developer (not shown on diagram)
- Interconnection/Net Metering Agreement: Utility and Renewable Developer (and/or Federal Site)

Possible Additional Agreements

- Interagency Agreement (IA): Western and Federal Site
- REC Contract: Developer and Utility
- Excess Electricity Contract: Developer and Power Purchaser



- DESC = Defense Energy Support Center/DLA Energy
- Western = Western Area Power Administration

*PPA Project Process Guidelines**

**This process assumes that the renewable project(s) have been selected and that evaluation of contracting/financing options has already occurred with selection of the PPA option.*

**FEMP assistance available throughout process.*

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Project Process - Phase 1 Go/No Go Considerations

- PPA legality and Commission oversight
  - Is the PPA model legal in the state/utility service territory?
    See http://www.dsireusa.org/summarymaps/index.cfm?ee=1&RE=1
  - Is the renewable developer subject to Commission oversight?
  - Are there Commission approval requirements (for REC sale or other)?
  - 40 USC 591: Electricity purchases must abide by state law

- Who owns the land and/or building(s)? Is there a management company involved?
  - Who pays the utility bill?
  - Who will sign the contract(s)?

- Future site plans – is there any chance of building/site shut-down?
  - If so, could include option to move the system if the site decides to move forward with the project.

Project Process - Phase 1

- Gather utility bills and other energy use information (such as sub-meter data) - utility tariff type, rate & demand charge structure (peak/ non-peak, TOU, etc)
  - Competitive electric supply contract information (if applicable)
  - Compare energy usage information to renewable generation

- Research renewable energy certificate (REC) markets, applicable incentives and renewable policies
  - Applicable incentives (rebates, tax incentives, etc) and REC markets (see http://www.dsireusa.org/)
  - Potential rate impacts and other pertinent utility policies (standby charges, tariff impacts)
  - Consider net metering and other applicable policies (such as feed-in tariff)

RPS Policies with Solar/DG Provisions

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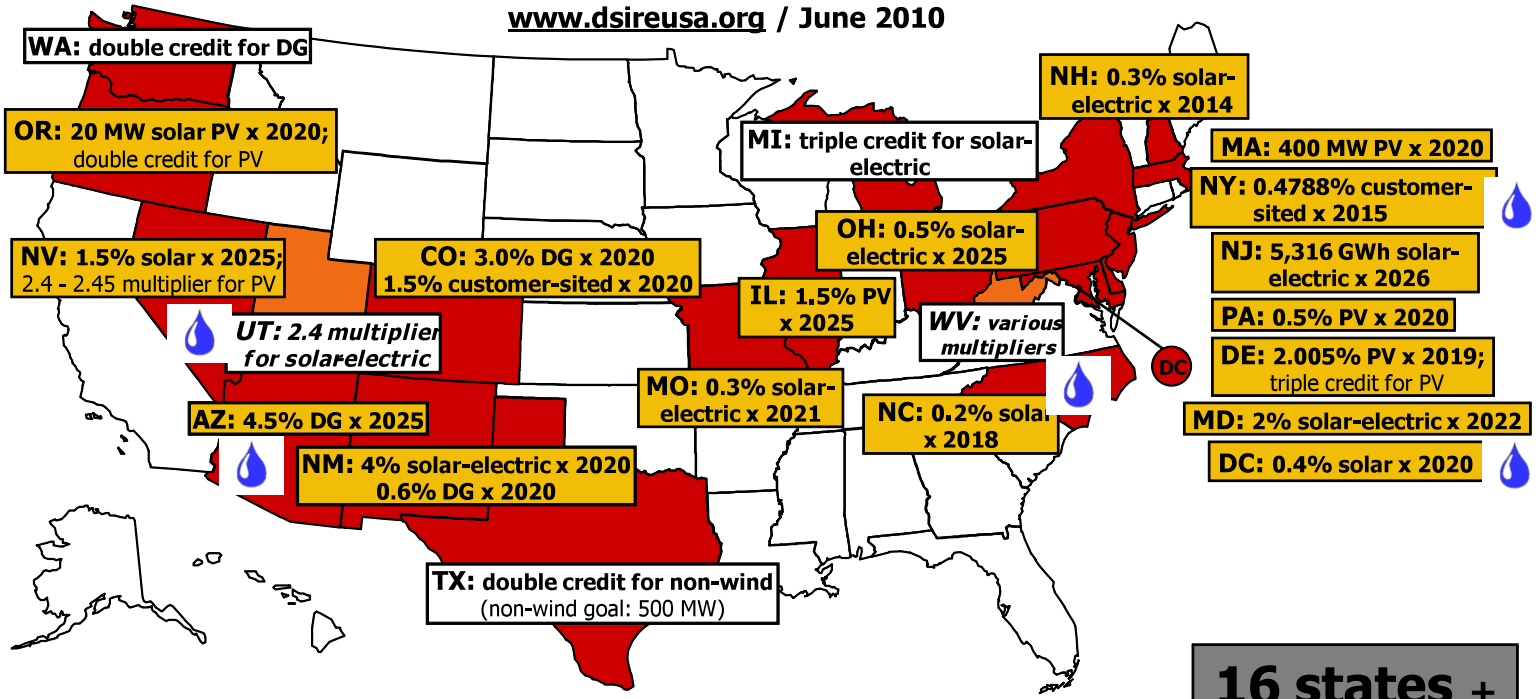
DSIRE™ Database of State Incentives for Renewables & Efficiency

North Carolina Solar Center | IREC

RPS Policies with Solar/DG Provisions

www.dsireusa.org / June 2010



State renewable portfolio standard with solar / distributed generation (DG) provision

State renewable portfolio goal with solar / distributed generation provision

Solar water heating counts toward solar provision

16 states + DC have an RPS with solar/DG provisions

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Net Metering

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DSIRE
Database of State Incentives for Renewables & Efficiency

North Carolina Solar Center | IREC

Net Metering

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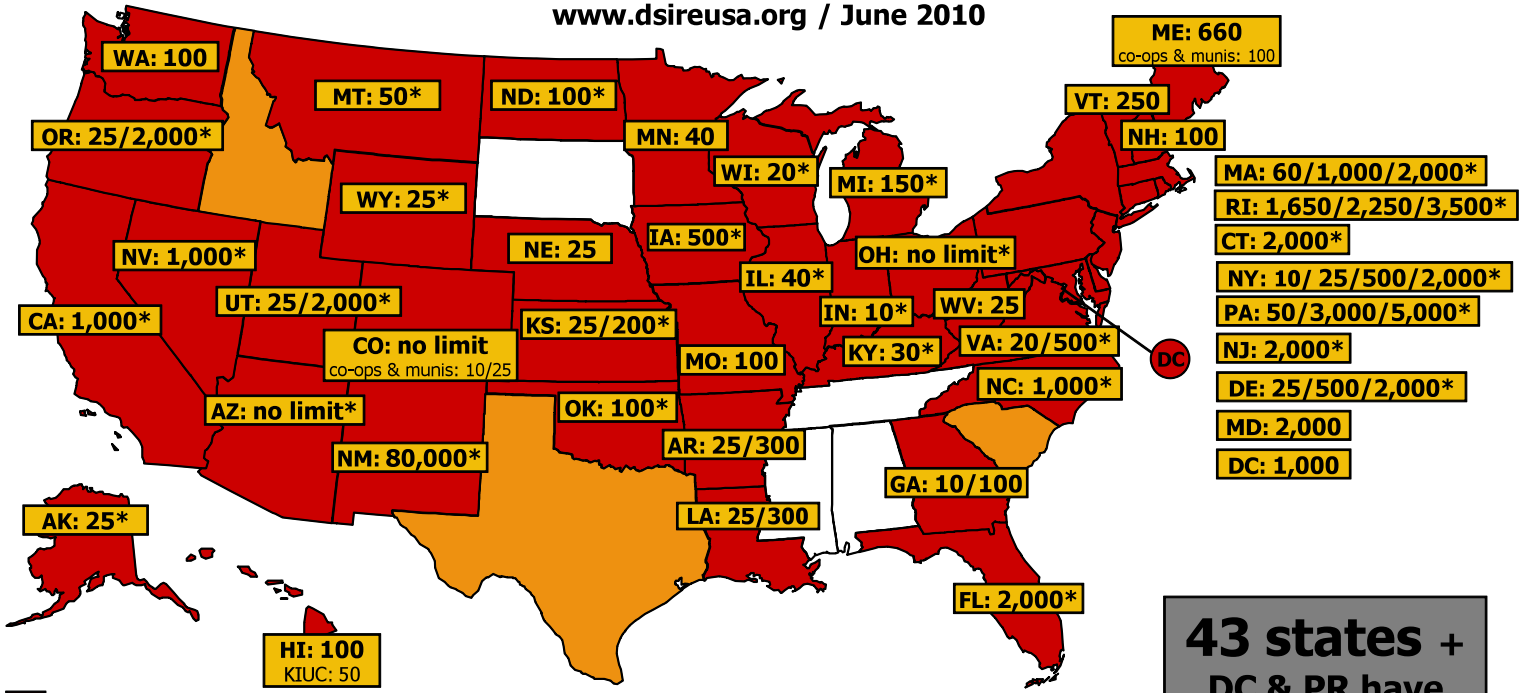

State policy

Voluntary utility program(s) only

* State policy applies to certain utility types only (e.g., investor-owned utilities)

43 states + DC & PR have adopted a net metering policy

Note: Numbers indicate individual system capacity limit in kW. Some limits vary by customer type, technology and/or applicati Other limits might also apply.

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Project Process - Phase 1

- Get upper management buy-in and ensure project compatibility with future site plans and mission
- Form project team – *champion*, decision-maker, energy manager, facilities, contracting officer, attorney, renewable expert, electrical engineer, budget, real estate, environmental, sustainability, safety, other
- Determine if there are non-federal stakeholders (other than the utility) that will have an interest in the project
- Investigate and fully understand approval process
- Establish roles and responsibilities
- Develop a timeline
- Schedule periodic meetings to keep project on track

Project Process - Phase 1

- PPA contract length
  - Long term best: at least 10 years, preferably 20
  - Possible authorities:
    - FAR Part 41 – Utility Services (10 year authority)
      - GSA authority, delegated to certain agencies
    - FAR Part 41 Program Guidance Instructions (PGI)*
    - FAR Part 12 – Acquisition of Commercial Items (5 year authority)
    - FAR Part 15 – Contracting by Negotiation
    - DOD 10 USC 2922A – 30 year authority, requires Secretary of Defense approval
    - Congressional proposals for long term renewable contracting authority
    - Other options under consideration

*Used for Nellis AFB indefinite term contract, with one year termination notice

http://farsite.hill.af.mil/reghtml/regs/far2afmcfars/fardfars/dfars/PGI%20241_2.htm#TopOfPage

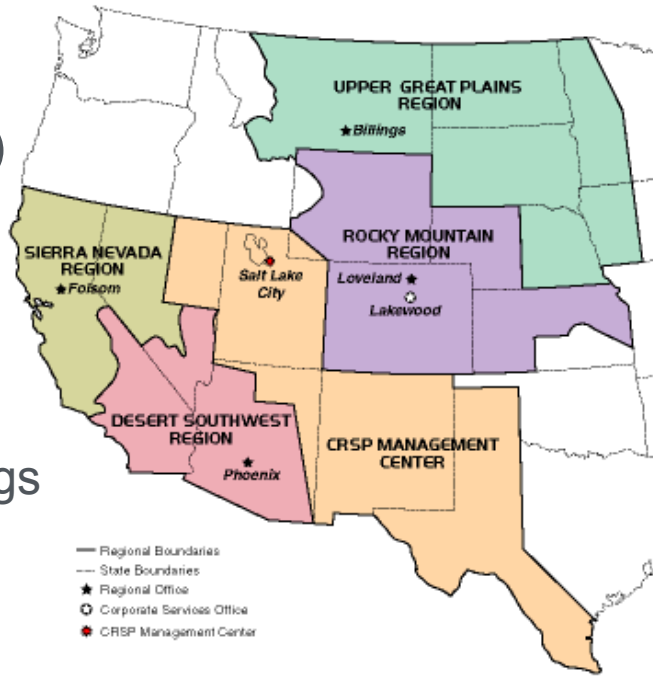
Project Process - Phase 1

- PPA contract length (continued)
  - Western Area Power Administration (Western) Option
    - Long term contract authority - at least 20 years
    - Federal agencies in Western's service territory can use Western as the contracting agent
      - Site selects renewable developer and brings to Western (Western currently does not do RFPs)
    - Examples: NREL, Fort Carson
    - Nominal fee for Western's services
    - Renewable Resources for Federal Agencies (RRFA) program

      Randy Manion, (720) 962-7423, manion@wapa.gov

      http://www.wapa.gov/powerm/pmtags.htm

      (See program brochure at bottom of web site.)



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Project Process - Phase 1

- Coordinate with the local utility
  - VERY important to notify the utility early on in project development
  - Interconnection requirements – application, cost, study requirements, queue and timeframe
  - Interconnection agreement terms & conditions
  - Utility rate impacts – possible tariff change, standby charges, etc.
  - Renewable system tie-in options: What is acceptable to the utility?
    - Simpler if entire site is on one meter. Separate electrical lines may be required if buildings are individually metered (unless the utility will allow connection on the utility side of the meter).
  - Net Metering (and Feed-In Tariff if applicable) rules
    - How do they measure renewable project capacity for net metering limit purposes (ex. ac, dc, based on inverter capacity)?

Project Process - Phase 1

- Investigate National Environmental Policy Act (NEPA), Endangered Species Act (ESA), National Historic Preservation Act (NHPA), and other applicable federal/state/local environmental and permitting requirements
  - Crucial to investigate requirements early in process and get required environmental studies started as soon as possible

- Stormwater management – EISA Section 438 and other local requirements

- EPA Rule to control discharge of pollutants from construction sites (erosion and sediment control measure requirements)

  http://www.epa.gov/waterscience/guide/construction/

- Water availability (for most concentrated solar power and biomass)
  - May need to consider dry or hybrid cooling options

Project Process - Phase 1

- Explore “land use agreement” options - lease, easement, license, right-of-way, other
  - Separate contract
  - Investigate options and approval requirements early in process
  - Contract length limitations likely (agency authorities vary)
  - Will likely include site access, security, environment, safety, and/or health provisions
  - Long term land use agreement can help project viability if short term PPA contract length (ex. Nellis AFB)
  - GSA revocable license, Form 1582 available at http://www.gsa.gov/Portal/gsa/ep/formslibrary.do?viewType=DETAIL&formId=171CF1BCDA983EA985256AA2004B7297

- Possible requirements
  - Land appraisal and/or legal survey
  - Environmental baseline study (to document conditions that must be met at end of contract if system removal and restoration is required)

Project Process - Phase 1

- Renewable energy certificate (REC) ownership
  - RECs represent the environmental attributes of electricity produced from renewable sources
  - Ensure that PPA contract explicitly spells out REC ownership
  - Solar RECs may be very valuable
  - If RECs are sold, then must use "REC swap" option for credit towards EPACT 2005 renewable goal and on-site double bonus
    - Sell valuable RECs, purchase cheaper national RECs
    - Federal Renewable Guidance http://www1.eere.energy.gov/femp/pdfs/epact05_fedrenewenergyguid.pdf
  - Check final EO13514 Guidance for greenhouse gas (GHG) reduction policies. It is unlikely that on-site projects that sell RECs will get GHG reduction credit.

Project Process - Phase 1

- Ground-Mounted PV Systems
  - Solar land requirements vary depending on PV type/efficiency (crystalline vs. thin film) and system type (fixed vs. tracking)
  - Soil conditions
  - Road, fence and other requirements (define who pays)
  - Shading
  - Wind considerations

- Roof PV Systems
  - Roof information
    - Type
    - Age and roof replacement plans
    - Maximum load the roof can safely support
    - Roof warranty - potential impacts and solutions
    - Potential roof leaks – may want to limit or prohibit roof penetrations
  - Roof orientation
  - Shading and roof obstructions (HVAC equipment, vents, etc)
  - Fire protection (GSA has guidelines, so do states such as California)
  - Wind considerations

Project Process - Phase 1

- Other renewable considerations
  - ex. wind: height, radar interference

- Electrical considerations
  - Who owns the site electric lines?
  - Gather electrical drawings and other pertinent site information
  - Tie-in options (choose renewable size/location that is compatible with the site electrical system)
  - Any expected electrical upgrades required?
  - Inverter location options
  - Is your site tied to a network distribution system?
    - See report for solutions: http://www.nrel.gov/docs/fy09osti/45061.pdf
  - Include drawings and other information as part of RFP package

Project Process - Phase 2

- Choose contracting agency
  - Site or other agency contracting staff
  - Defense Energy Support Center (DESC) Renewable Team
    - Leads: Andrea Kincaid/John Nelson
    - https://www.desc.dla.mil/DCM/DCMPage.asp?pageid=589
  - Sites in western U.S. can utilize Western Area Power Administration as contracting agent. They negotiate & sign the PPA contract (once renewable developer is selected)

- Optional step - Request for Information (RFI)

- Develop Request for Proposal (RFP), “Opportunity Notice,” or other procurement document

Project Process - Phase 2

RFP Provisions

- Renewable specifications
  - Ensure there are no hidden costs (such as inverter replacement) – specify that renewable developer is responsible for all repair and replacement

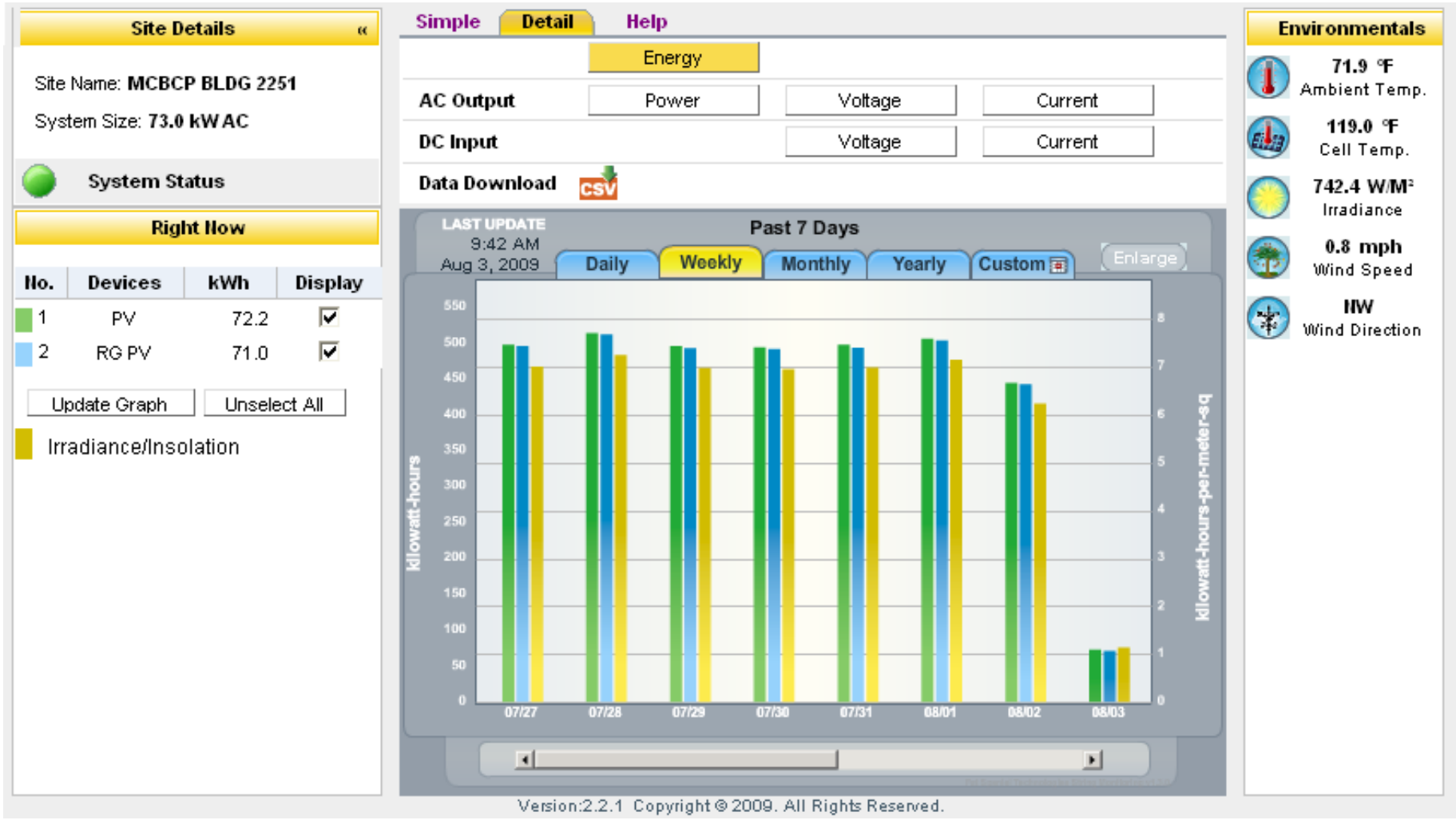
- End of contract options
  - System removal & land restored to original condition
  - System "abandoned in place"

- Other potential end of contract options
  - System purchase – must be at fair market value (required for tax eligibility, to ensure contract is not considered a capital lease)
  - Contract extension/options - depends on contracting authority limitations, may be in the land use agreement rather than the PPA
  - Issue a new solicitation for a follow-on contract

- Submittal requirements (linked to the evaluation criteria) - financial capability is very important given economic conditions

- Require meters that provide real-time access to generation information
  - Ensure compatibility with REC buy/other requirements and the site's energy management system

PV Output


Site Details
Site Name: MCBCP BLDG 2251
System Size: 73.0 kW AC
System Status
Right Now
No. Devices kWh Display
1 PV 72.2
2 RG PV 71.0
Update Graph
Unselect All
Irradiance/Insolation
Simple
Detail
Help
Energy
AC Output
Power
Voltage
Current
DC Input
Voltage
Current
Data Download
CSV
LAST UPDATE
9:42 AM
Aug 3, 2009
Past 7 Days
Daily
Weekly
Monthly
Yearly
Custom
Enlarge
kilowatt-hours
kilowatt-hours-per-meter-sq
07/27
07/28
07/29
07/30
07/31
08/01
08/02
08/03
Environmentals
71.9 °F
Ambient Temp.
119.0 °F
Cell Temp.
742.4 W/M²
Irradiance
0.8 mph
Wind Speed
NW
Wind Direction
Version:2.2.1 Copyright © 2009. All Rights Reserved.

Project Process - Phase 2

- Proposal Evaluation
  - Evaluation Options: low price, technically acceptable (LPTA), best value, low price
  - Evaluation Team
  - Evaluation Criteria
- PPA Electricity Price
  - Escalation factor typically included (usually 1-3%)
  - De-escalation factor is also an option
  - May be fixed price or tied to utility rate
  - Evaluate price and escalation factors carefully
  - Consider other potential electric bill changes:
    - Standby charges
    - Possible utility tariff changes
    - Impacts due to time-of-use, peak/non-peak and/or seasonal rates
    - Demand charge savings (keep in mind that savings will be minimal)
- Compare price proposals to NIST/EIA rates and/or other rate forecast
  - NIST/EIA - “Energy Price Indices and Discount Factors for Life-Cycle Cost Analysis - May 2009, Annual Supplement to Handbook 135” (http://www1.eere.energy.gov/femp/pdfs/ashb09.pdf)

Project Process - Phase 2

- Issue RFP and distribute widely
  - FedBizOpps
  - Green Power Network (http://apps3.eere.energy.gov/greenpower/financial/)
  - Applicable renewable industry association (SEIA, AWEA, etc)
  - Other

- Site visit/tour and pre-proposal meeting
  - Access requirements
  - Safety plan (especially if roofs involved)
  - Method to ensure everyone has access to the same information (especially for Q&A during site tour)

- Evaluate bids, award contract

Project Process - Phase 3

- Project construction
  - Coordinate with renewable developer to ensure that crucial deadlines are met – such as those associated with REC purchase and/or incentives
  - Assist with net metering, interconnection studies, contract negotiations and other applicable requirements
  - Assist with rebate and other incentive applications when necessary
  - Single site point of contact helpful

- Publicity
  - **Be careful what you say if RECs are not retained by the site**
  - Press conference
  - Press release
  - Web site stories (FEMP or other)
  - FEMP Focus stories

- Operation
  - Track actual production to ensure system operation and for annual reporting purposes
  - Purchase replacement RECs if necessary

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Other Information & Considerations

- Ensure lease provisions allow for solar and other renewables

- Include solar-ready specifications for new buildings/roofs
  - New NREL report “Solar Ready Buildings Planning Guide” http://www.nrel.gov/docs/fy10osti/46078.pdf

- Template PPA tool kit documents in development

PPA Hybrid Options

PPA Hybrid Options

- Energy Services Agreement (ESA) - PPA within an ESPC
  - Pro: ESPC has a 25 year contract authority
  - ESCO/partner retain ownership and take advantage of tax benefits
  - Fixed payment to match guaranteed production
  - Lower payment if guaranteed production is not met
  - Several projects in progress - no signed contracts yet
  - NREL can assist Agency & ESCO with ESA implementation

- Utility Renewable Electricity Services Contract (URESC) – PPA with utility
  - Contract with local serving utility for the purchase of electricity from utility owned, utility operated on-site renewable generation
  - Utility/partner retain ownership and take advantage of tax benefits
  - Possible authority - FAR Part 41.501c4 (FAR 52.241-5 Contractor's Facilities)
  - Draft template agreement developed through Energy Lawyers and Contracting Officer Working Group
  - Currently pursuing a pilot project

Example Federal PPA Projects

Nellis AFB PV Project in NV

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- 14.2 MW single axis ground mounted PV on 140 acres including closed landfill
- PPA price – 2.2¢/kwh
- Estimated first year electricity savings = $1 million, after standby charges
- RECs sold to Nevada Power (for state RPS solar set-aside)
- FAR Part 41 utility service contract
- Indefinite term with one year termination notice (using FAR Part 41 PGI)*
- 20-year ground lease
- Ribbon cutting event December 2007
- Performance Monitoring web site http://mypowerlight.com/Commercial/kiosk.aspx?id=1dd14d57-7840-4b2d-af0a-0fe0fdd5c872

*http://farsite.hill.af.mil/reghtml/regs/far2afmcfars/fardfars/dfars/PGI%20241_2.htm#TopOfPage

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NREL PV Project in CO

- 720 kW (1200 MWh) single-axis tracking, ~ 5 acres
- 20-year PPA contract (utilizing Western)
- 20-year easement
- RECs sold to Xcel Energy for RPS solar set-aside (20 year contract)
- PPA price equal to or less than utility electricity prices (based on EIA projections)
- Operational December 2008
- Additional PV projects
  - 118 kW roof-top (operational)
  - 1.116 MW ground-mounted (operational)
  - Roof-top system for new building that is under construction (estimated 500 – 750 kW)

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Fort Carson PV Project in CO

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- 2 MW, 3200 MWh in first year (~2% of Ft. Carson's load)
- Fixed, non-escalating energy rate
- 17-year contract, with 3 year option (utilizing Western)
- No cost 20 year lease (using 10 USC 2667 lease authority)
- RECs sold to Xcel Energy (20 year contract)
- Ground-mounted, fixed system covering 12 acre former landfill
- First Solar thin film, 25 year warranty
- Came on-line December 2007

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GSA Sacramento PV Project in CA

- .5 MW roof-top PV (thin film)
- 10-year contract
- Price matched to utility energy rate, with price floor
- Utility rebate and federal incentives (30% tax credit & accelerated depreciation) - pay for approximately 1/2 cost
- License for use of roof
- Renewable developer retains RECs
- Came on-line March 2008

USCG Petaluma PV Project in CA

- 855 kW ground-mounted, fixed PV on slightly less than 4 acres
- PPA price is 13¢/kWh in the first year, with 3.5% annual escalation
- One year contract with 24 one year renewal options
- Irrevocable 25 year license
- Developer receives 25¢/kWh California Solar Initiative (CSI) performance based incentive (PBI) payments for first 5 years
- Site retains RECs
- Came on-line April 2010

Project Comparison

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	Nellis AFB, NV	Fort Carson, CO	NREL, CO	GSA Sacramento, CA	USCG Petaluma, CA
Size	14.2 MW, 140 acres including closed landfill	2 MW on 12 acre closed landfill	1954 kW total (720 kW on 5.4 acres, 1116 kW and 118 kW)	.5 MW	855 kW on ~4 acres
Type	Ground Mounted, Single Axis Tracking PV	Ground Mounted, Fixed PV	Ground Mounted, Single Axis Tracking PV	Roof-top PV	Ground Mounted, Fixed PV
PPA Contract Length	Indefinite with 1 year termination	17 with 3 yr option	20 years	10 years	1 yr with 24, 1 yr options
Land Use Agreement	Lease (20 yrs)	Lease (20 yrs)	Easement (20 yrs)	License (10 yrs, included in PPA)	Irrevocable License (25 years)
Procurement and Contracting Agent	Site	Site, in partnership with Western	Site, in partnership with Western	Site	Site
RECs	Sold to utility	Sold to utility	Sold to utility	Retained by renewable developer	Transferred to site

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In Progress Projects

- EPA Edison, New Jersey
  - 10 year PPA contract, 10 year license
  - https://www.fbo.gov/index?s=opportunity&mode=form&tab=core&id=cd95bf513dfc8c71ff5e6e19c2cc7c0d&_cview=0
- DLA Tracy Defense Distribution Depot, San Joaquin, CA
  - https://www.desc.dla.mil/DCM/DCMSolic.asp?SolicID=1533
- Navy SW Div Multiple Award Contract (MAC)/IDIQ, with Barstow, 29 Palms and China Lake Task Orders
  - https://www.neco.navy.mil/synopsis/detail.aspx?id=219672
  - https://www.neco.navy.mil/biz_ops/840-v5static.aspx?hkey=82419630
  - http://www.navy.mil/search/display.asp?story_id=51636

Enhanced Use Lease (EUL)

Enhanced Use Lease (EUL)

- Only certain agencies have an EUL authority
- EUL is a real estate agreement
- The lease is competed (rather than the energy purchase, as in a PPA)
- Payment or in-kind consideration
- Usually for large projects where project size > site load
- GovEnergy 2009 presentations: http://www.govenergy.com/presentations.php#finance (Session 5)
- GovEnergy 2008 presentations: http://www.govenergy.com/2008/presentations2008.html#finance (Session 5)

EUL Example – Fort Irwin

- Notice of Opportunity to Lease
- Up to 1000 MW at 5 Fort Irwin sites (initial 500 MW project)
- In-kind services equal to or greater than fair market value of land
- Developer selection announced July 30, 2009 – Clark and Acciona Solar Power
  - First phase: More than 500 MW solar thermal/PV by 2022
- http://eul.army.mil/ftirwin/

NASA Kennedy Space Center and FP&L EUL

- Partnership between NASA and Florida Power & Light
- EUL signed June 2008
- Phase 1 involves 60 acres, potential phase 2 for additional 40 acres
- 10 MW FPL-owned PV project
  - Output feeds into FPL transmission system
  - Substation expansion required
- In-Kind Consideration - 990 kW NASA-owned PV
  - FPL construction
  - Output feeds into NASA-owned distribution system
- 130 mph wind standard
- Both systems operational
- See http://www.fpl.com/environment/solar/spacecoast.shtml

PPA Support/Resources & Key Points

Key Points

- Ensure that the PPA option is allowed
- Contact your serving utility early on for interconnection agreement and study requirements/timeframe/cost and other project considerations (net metering, tariff implications, standby charges, etc)
- Research applicable incentives and policies (http://www.dsireusa.org/)
- Review contract length options
- Determine NEPA and other environmental/permitting requirements and start the process early
- Discuss land use agreement options and develop draft agreement
- Consider renewable tie-in options (taking into account utility metering for your site)

PPA Support

- Renewable screening/assessments to determine potential cost effective renewable projects
  - FEMP conducts renewable screening for every new ESPC project. This screening also available for UESC and other potential renewable projects
  - Information available at http://www.eere.energy.gov/femp/financing/espcs_techplanning.html

- Project assistance
  - Market research assistance
    - Applicable incentives and/or solar REC market
    - Possible utility bill impacts (tariff/competitive electric supply changes, standby charges, etc.)
    - Interconnection, net metering and other applicable policies/requirements
  - Assistance with other requirements such as land use agreement (lease, easement, license, other)
  - Solicitation
  - Proposal evaluation

Resources

- Chandra Shah, National Renewable Energy Laboratory (NREL)
  chandra.shah@nrel.gov, 303-384-7557
- Gerald Robinson, Lawrence Berkeley National Laboratory (LBNL)
  gtrobinson@lbl.gov, 510-486-5769
- Mike Warwick, Pacific Northwest National Laboratory (PNNL)
  mike.warwick@pnl.gov, 503-417-7555 (for DOD sites)
- FEMP Focus article (Fall 2007, p. 16-17)
  http://www1.eere.energy.gov/femp/news/fempfocus.html
- FEMP PPA web site (includes a Sample Document page with sample RFP, land use and other documents)
  http://www.eere.energy.gov/femp/financing/power_purchase_agreements.html
- EPA Solar PPA web site (for all sectors, not just federal)
  http://www.epa.gov/greenpower/buygp/solarpower.htm
- EPA Solar PPA 7/28/09 webinar (for all sectors, not just federal)
  http://www.epa.gov/greenpower/events/july28_webinar.htm

FEMP Federal Energy Management Program

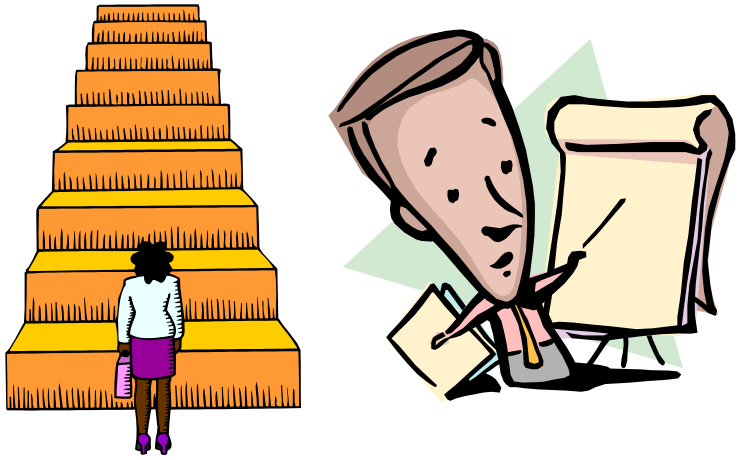
U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Julia Kelley
Oak Ridge National Laboratory

UESC Overview

Our Objectives

- Description of UESC and Legal Authority
- Quick Look at UESC Process
- UESC Process Key Issues/Decisions
- Available Tools & Resources



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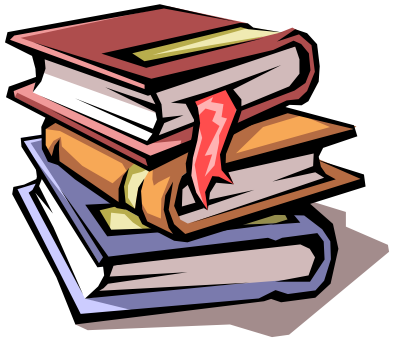
Description of UESC and Legal Authority

Utility Energy Service Contracts (UESCs)

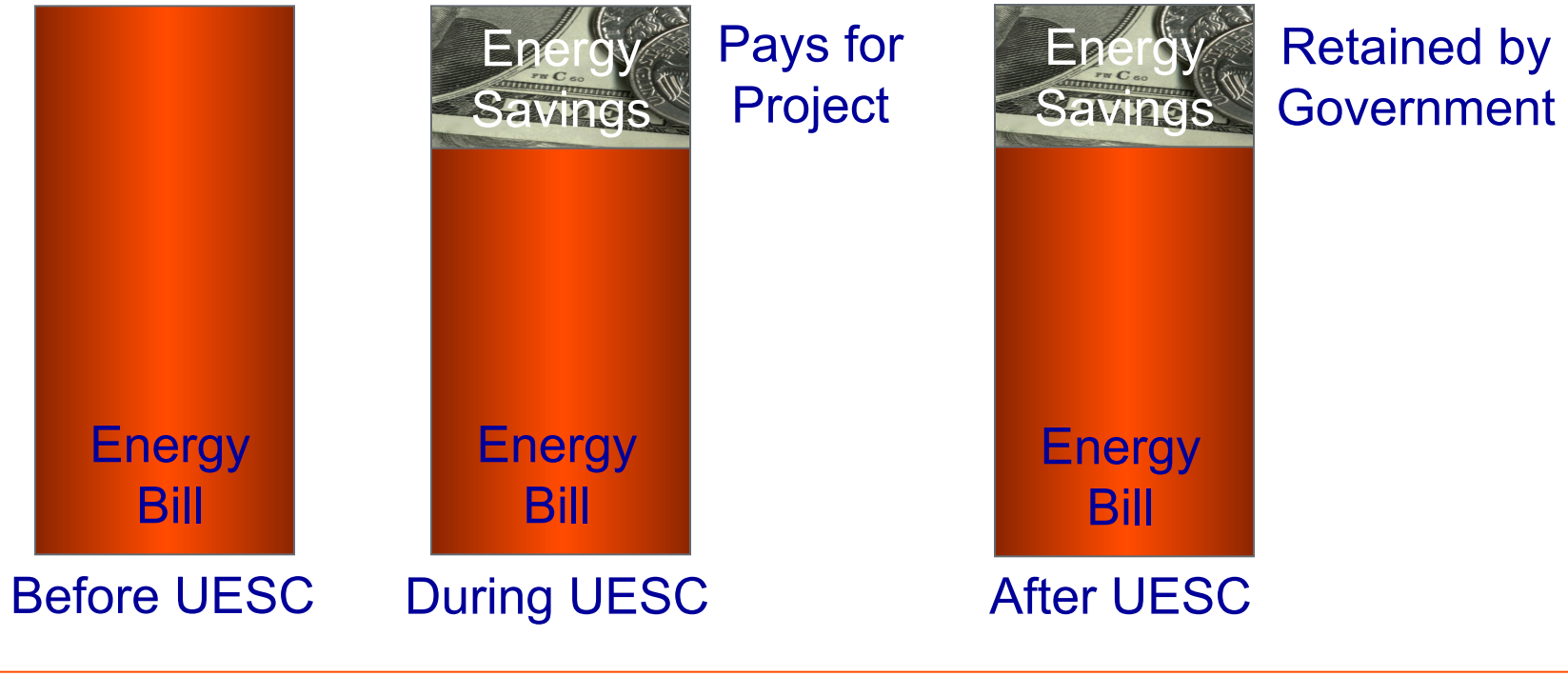
- Definition: Specific contracts that allow utilities to provide agencies with comprehensive energy and water efficiency improvements and demand reduction services.

- Utilities assess the opportunities, design and implement the ECMs, front the capital costs, and are paid out of savings.



UESCs Reallocate the Government's Utility Budget

- Decrease energy costs
- Pay for project costs
- Achieve energy savings for the government



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

Typical UESC Offerings

Technical Services

- Audits
- Feasibility Studies
- Engineering & Design
- Construction & Installation
- Performance Guarantees
- Training
- O&M Services
- Project Management

Financial Services

- Rebates
- Project Financing

Other Typical 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

Energy Policy Act of 1992

- 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)

FEMP's UESC Enabling Documents

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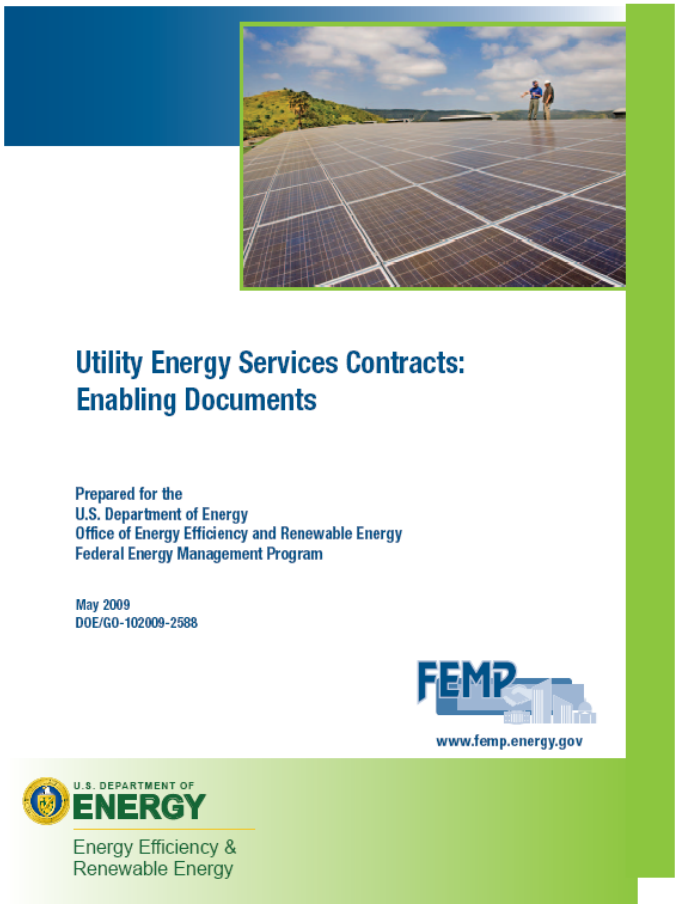
- Details:
  - Legislation and Executive actions
  - Legal opinions
  - Agency guidance



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

Enabling Documents

- GSA — Authority for Extended Utility Agreements — Authorized to enter contracts for terms greater than ten years.
- 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.
- 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.

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Quick Look at UESC

Process Overview

The UESC Process

Determine the Appropriate Vehicle

Assemble Your Acquisition Team

Planning

The Utility Audit

Establish Terms & Conditions

Identification

The Feasibility Study

Engineering & Design Package

Construction & Installation

The Payment Period

Implementation

UESC Vehicles

- Areawide Contract (AWC)
  - Task order placed underneath to establish terms and conditions for energy management services
- Site Specific Contract (Model Agreement)
- Basic Ordering Agreement (BOA)

UESC - Areawide Contract for Contracting Vehicle

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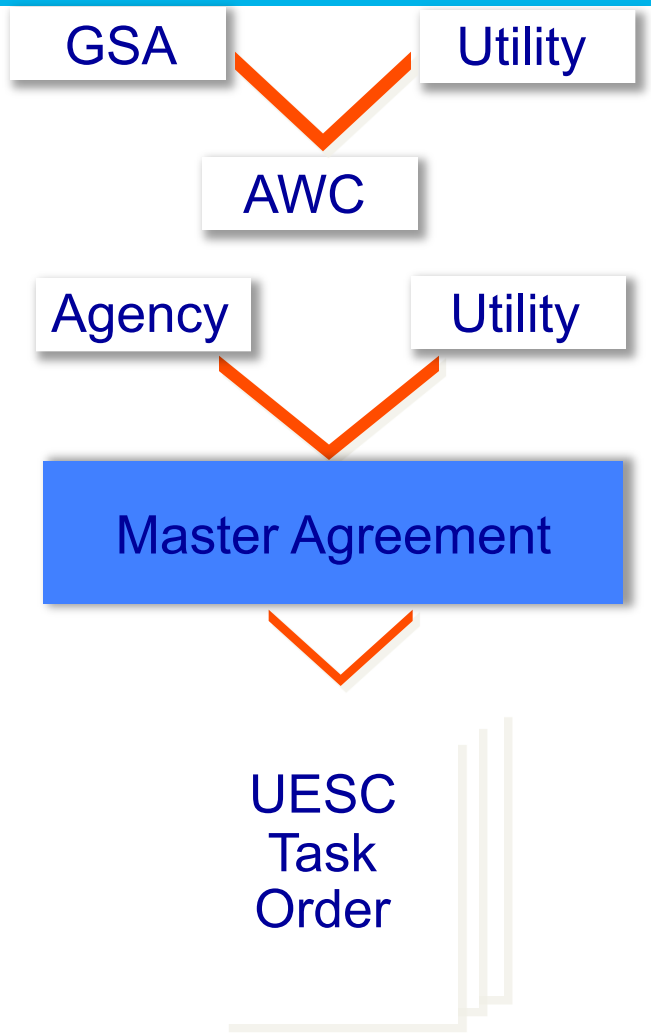


GSA places a blanket contract for utility services

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

48 CFR Part 41
Acquisition of Utility Services

- GSA authority to prescribe policies/methods governing the acquisition and supply of utility services for Federal agencies and delegating authority to specific agencies to purchase utility services

- GSA authority to issue areawide contracts for utility services

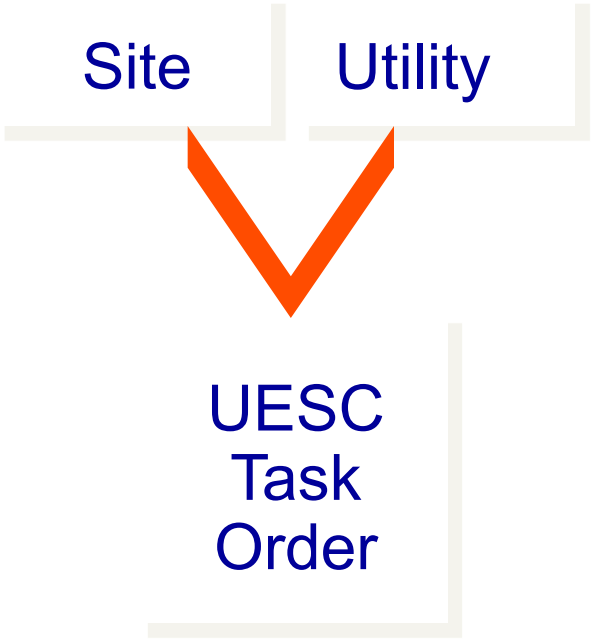
- Defines Utility Service as furnishing electricity, natural or manufactured gas, water, sewage, thermal energy, chilled water, steam, hot water, or high temperature hot water

GSA ECM Criteria

- Measure must produce measurable energy or water reductions or measurable amounts of demand reduction
- Measure must be directly related to use of energy or water, or demand reduction
- Preponderance of work must be for 1 or 2 above
- The measure must be an improvement to real property

UESC - Site-Specific Contract

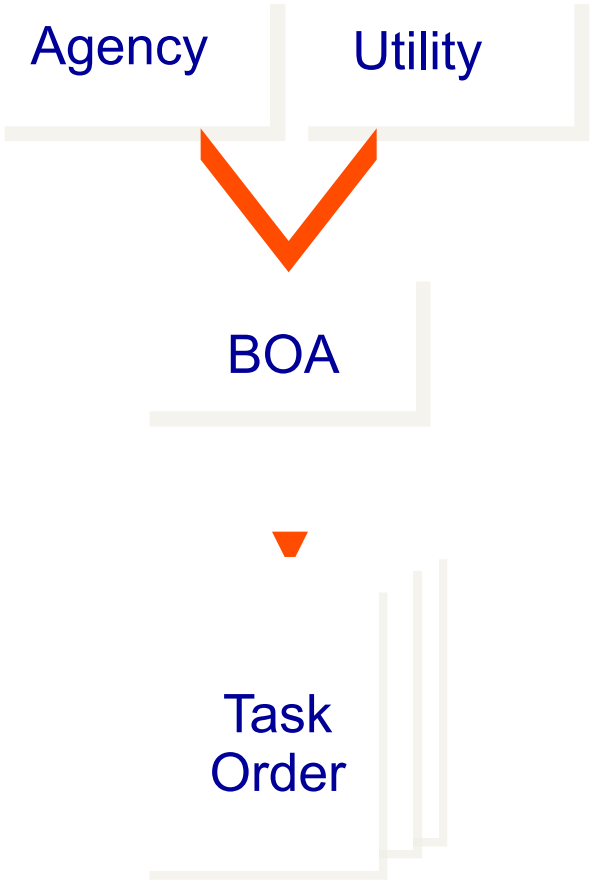
- Any site can place
- Includes all site specific terms and conditions
- Always an available option



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

UESC - Basic Ordering Agreement

- FAR Part 16 Service Contract, establishes terms & conditions for future contracts to provide services
- Any agency can place with a utility
- Task orders with project-specifics are placed underneath it



Agency and Utility can use the Model Agreement as the template for a BOA

UESC Model Agreement

- Developed by the Edison Electric Institute (EEI) and technical, legal, and contract officers of the Department of Defense, and the Department of Energy
  - Uniform, approved set of standard contract terms and conditions
  - Reviewed and approved by authorities from the public and private sectors
  - Contains ~80% of necessary terms and conditions for utility energy service contract

- Provides Federal and utility personnel assurance that language has been used successfully

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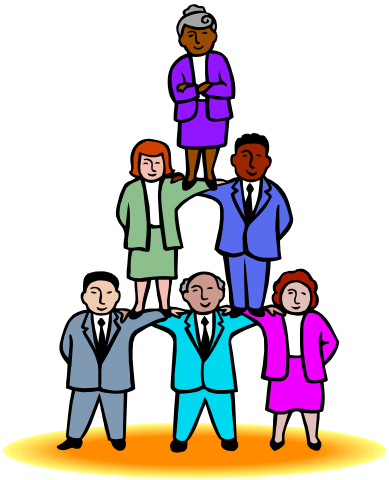
UESC Process
Key Issues / Decisions

Assemble an Acquisition Team

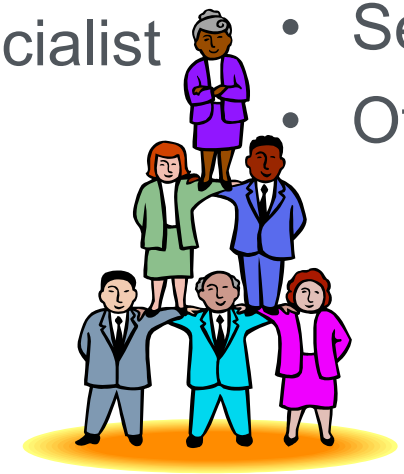
- Put your team together early
  - To ensure project buy-in and support
  - To reduce turn-around time for approvals
  - To expedite the procurement process
  - To keep each other informed of current and future agency plans that impact the project

- Prepare for team turnover
  - Document your process and establish a Project Documentation Plan
  - Capture institutional knowledge



Who Should Be On Your Team?

- Site decision maker
- Technical staff
- Procurement personnel
- Legal representative
- Budget representative
- Environmental specialist
- Tenants
- Operations staff
- Maintenance personnel
- FEMP Project Facilitator (optional)
- Security
- Other?



Potential Conflicts and Unique Issues

- Be clear that the utility budget will stay the same as it otherwise would have been and project payments come from saving
- Consider conflicts involving known and potential mission or facility usage changes
- Address unique facility issues like restricted access, special requirements (labs, libraries) or tenant's operations

Identify Your Project Goal

- Are you trying to:
  - Solve existing problems?
  - Make infrastructure improvements?
  - Reduce utility costs?
  - Make capital improvements?
  - Improve O&M?
  - Save energy?

Consider the Parameters

Site + Technologies + Contract Term

+ Required ECMs + Potential ECMs +

Collect Facility Data

- Historical utility data (including water)
- Current building and equipment data
- Data on anticipated facility and utility changes
- Any past audit or SAVEnergy audit information

Prioritize Facility Requirements

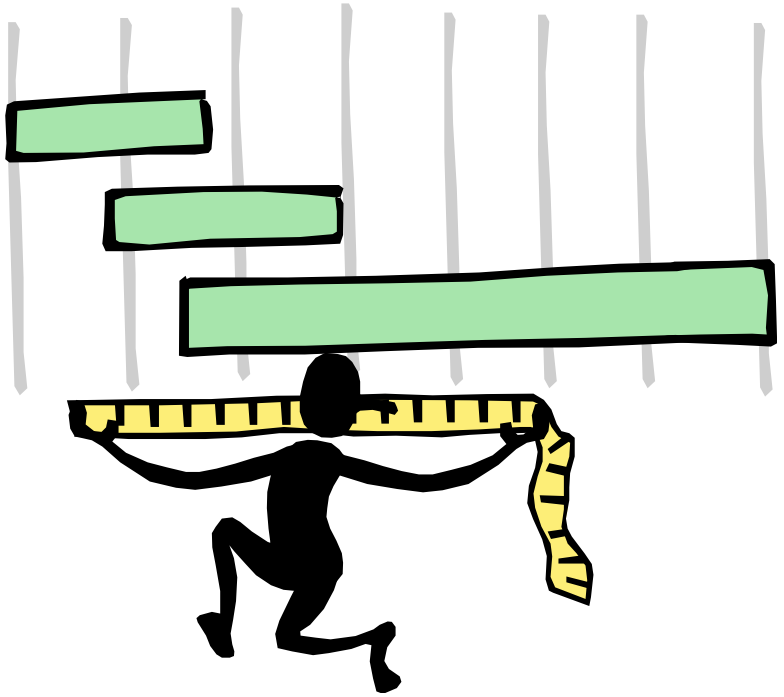
- Specific facility needs
- Facility conditions
- Constraining issues
  - Facility configuration requirements
  - Backup system requirements
  - Limited in-house resources
  - Union considerations
  - Work environment
  - Other support contracts

Select Potential ECMs

- Building envelope
- HVAC equipment, distribution and water heating system
- Lighting and power system
- Energy management and control systems
- Heat reclaim systems
- Renewable energy systems
- Air compression
- Combined heat and power, distributed energy resources
- Other? (When is metering an acceptable ECM?)

Do you want performance & savings verification?

What does it do for your project?



Performance Assurance

- Develop a Performance Monitoring Plan
  - Identify a means of measuring and/or calculating the energy being consumed and verifying the “savings” or avoided costs
- Resources:
  - FEMP M&V Guidelines: Measurement and Verification for Federal Energy Projects
  - FEMP guidance document on developing a performance monitoring plan for UESCs
- Also see Performance Assurance for Multi-Year Contracts under the Utility Incentive Program

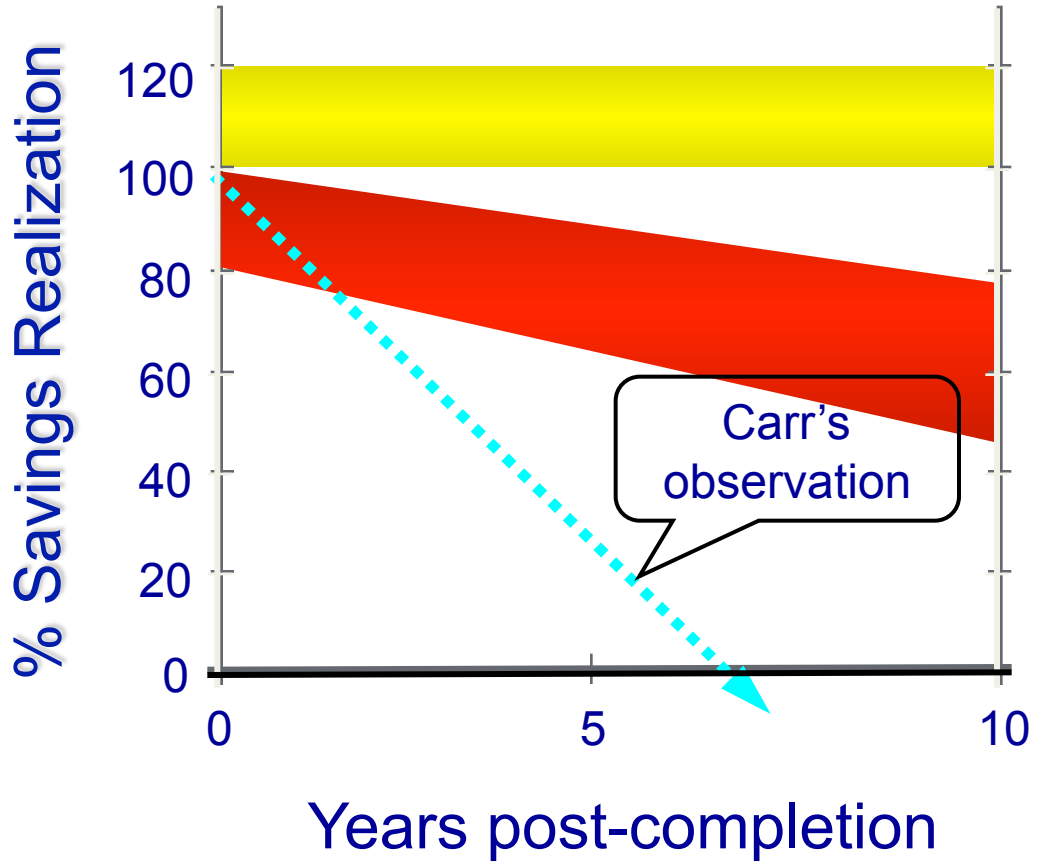
Commissioning

- Definition: A process for achieving, verifying and documenting that the performance of a building and its systems meet design intent and operational needs.

- The process extends through all phases of a project from concept to occupancy and operation.

- Building Commissioning Guide & Specifications can be found on the website.

Assured Continued Savings



Two Key Benefits

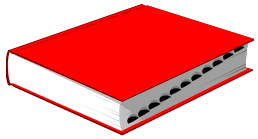
- Initial savings level
- Persistence of savings

Do All You Can

- Include all the opportunities available through UESC
  - Energy efficiency, water efficiency, alternative electric and/or gas supply, on-site power generation/CHP, renewables and renewable power purchases
- Incorporate a synergistic and interactive approach to the measures

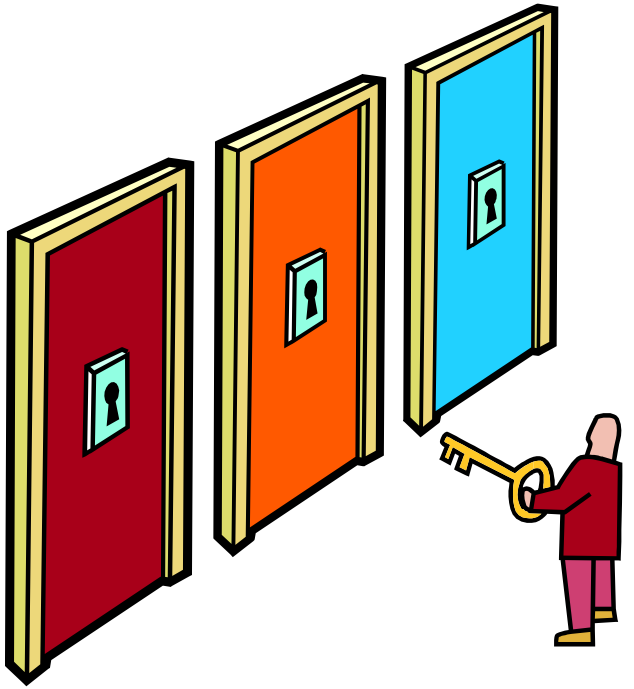
Bundling ECMs

- Definition:
  Bundling is the combination of long- and short-term payback ECMs at a single facility that supports a comprehensive project package.



Fuel-Neutral Approach

- If a technology is cost-effective and results in energy savings, it should be considered without regard to fuel source



The Cost of Delaying a Project

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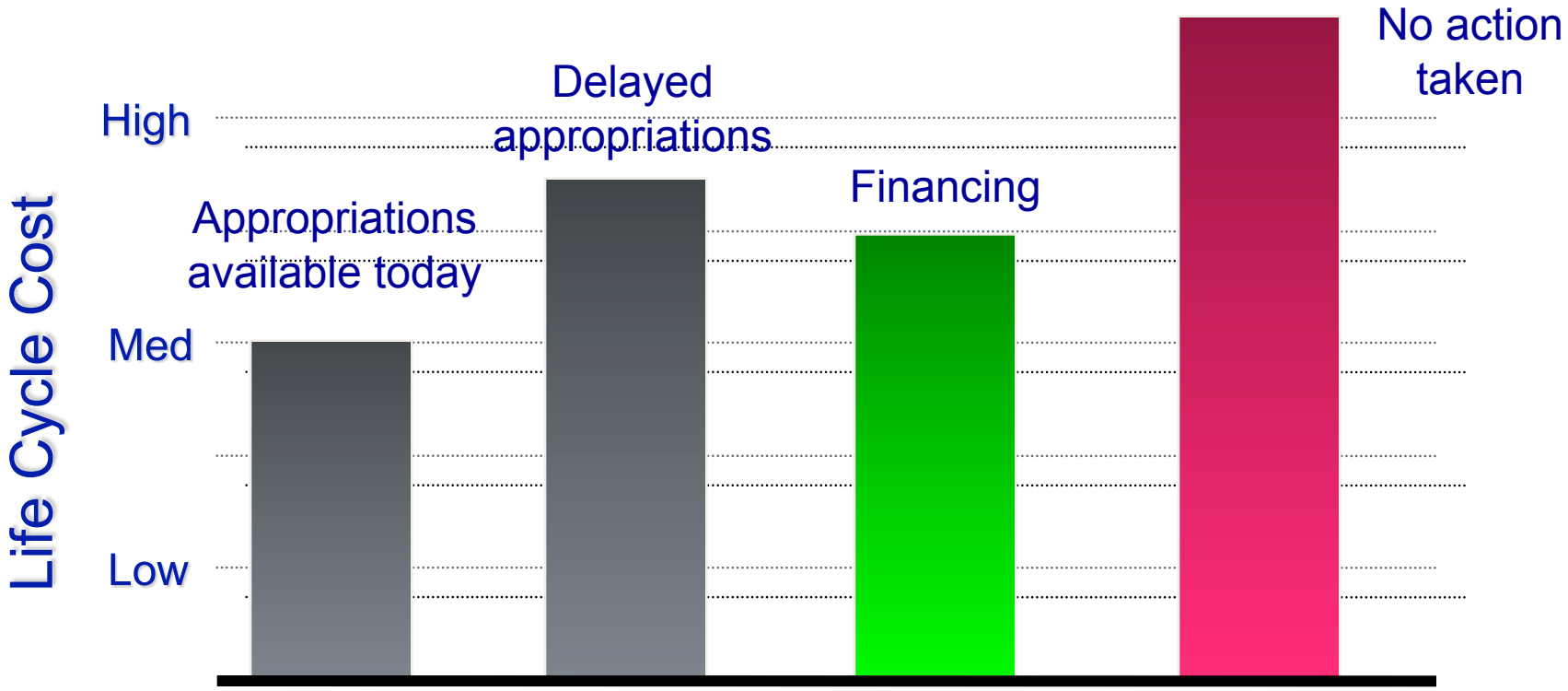

Any delay in project implementation results in loss of life-cycle savings

Follow-On Projects

- If additional ECMs are proposed after the original task order is awarded, the process begins again with the CO issuing a new task order and the utility submitting a technical and price proposal

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Available Tools and Resources

FEMP Website

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

www.femp.energy.gov

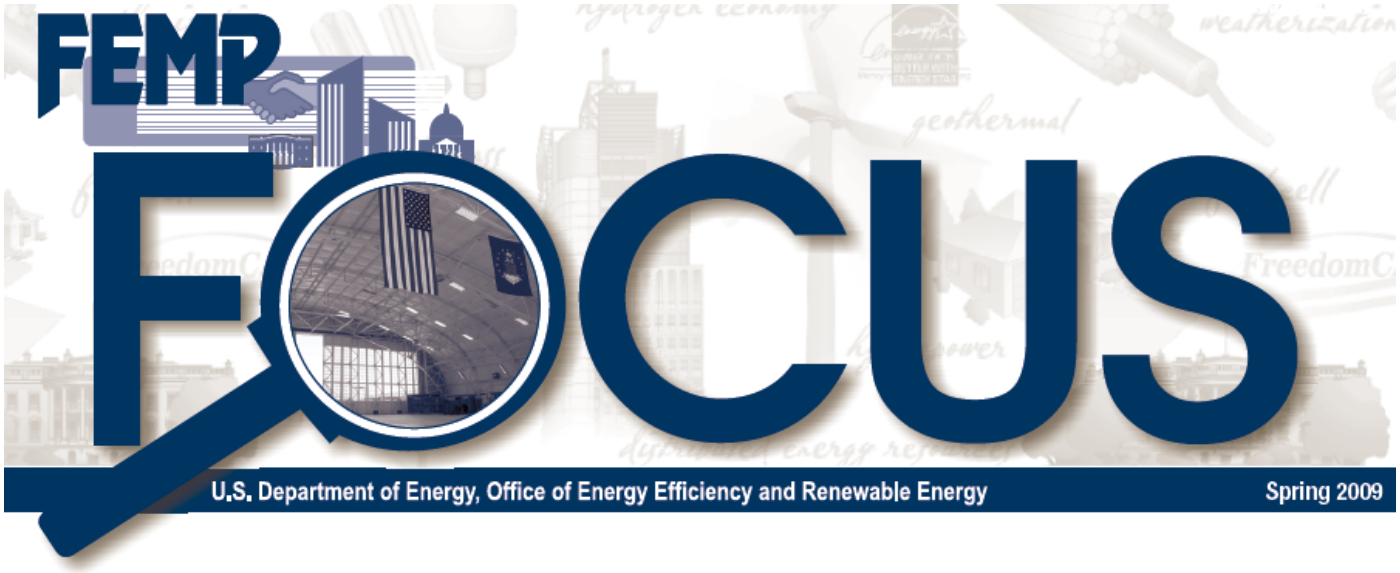
- Provides information to help agencies
- Meet Energy Goals and Regulatory Requirements
- Purchase Energy Efficient Products
- Manage Energy-Efficient and Alternative-Fuel Vehicle Fleets
- Design, Operate and Maintain High Performance Buildings
- Deploy Renewable Technology
- Finance and Contract Assistance for Energy Projects
- Cultivate Change to embrace Energy Efficiency and Renewable Energy

Available Resources

- Use GSA and FEMP for advice and support, briefings to project teams and management
- Find background information on web sites:
  - http://gsa.gov/pbs/xu/
  - http://www1.eere.energy.gov/femp/services/uma.html
- FEMP UESC video showcases this process. Video can be found at: http://www1.eere.energy.gov/femp/financing/uescs_nih.html

Direct Project Assistance

- Technical & procurement assistance for energy and water projects
  - Build partnerships and facilitate relationships
  - Project facilitation
  - Measurement & Verification Support
  - RFP development
  - Contracting expertise
  - Technical Proposal review
  - Process improvement, barrier reduction
  - Building core competency
  - Finance Workshops



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Questions?