ESPC Intro & ESPC/PPAs for RE

DHS Renewable Energy Roundtable

Doug Dahle

March 26, 2012

NREL/PR-7A40-54592
Overview

• Energy Savings Performance Contracting (ESPC) Principles
  o Understanding the money trail
• Energy Service Companies (ESCOs)
• Risk Management
• Tools for ESPC Customers
• Consider Master ESPCs
• Business Principles
• ESPC/Power Purchase Agreements (PPAs) for Renewables
Energy Savings Performance Contracts (ESPCs)

- Long-Term Partnerships (15-25 years)
- **Persistent** Performance is Success Factor
- Customer Champions & Commitment Critical
- “Reallocating Excess Energy Expense into Infrastructure”*
- No Capital Cost – Contractor Revenues from $ Savings*
- Determine Energy and $ Savings*
- Risks & Responsibility – Key focus for both parties
- Measurement & Verification – Verify Savings

* Figures in following slides
ESPC Principles

• Reallocating Excess Energy Expense into Infrastructure
  ▪ Pay a lower utility bill
  ▪ Pay the contractor
  ▪ Achieve cost savings for the government
Where the Money Comes From and Where it Goes

Agency Energy and O&M Bills

Cost Savings

Savings repay ESCO

ESCO pays for project

Customer Funds for Energy and Related O&M

Improvements create savings
The Project Cost Stack

*Data from Super ESPC projects awarded from 2005 to May 2008.
Figures may not add to exactly 100% due to rounding.
Energy Services Companies (ESCOs)

- A long term energy management partner
- Customer focused service & communications
- Listen to understand customer needs
- Offer solutions to best address customer needs
- Propose and document potential ESPC project
- Good faith negotiations to meet mutual needs
- Motivated – Financial return from long term revenues
Energy Services Companies

• **Expertise in Energy Efficiency & Supply Solutions**
• **ESCO delivers in ESPC**
  - Audits and Baseline Energy Status & Data
  - Design & Installation of Energy Measures
  - Arrange Financing
  - Commissioning & Post-Installation measurement
  - Customer training on installed measures
  - Operations & Maintenance (O&M)
    - Responsibility for O&M negotiable
  - Continuous verification of savings
Energy Conservation Measures

• Lighting
• Heating, Ventilation, and Air Conditioning (HVAC)/Variable Air Volume (VAV)
• Energy Management Control Systems
• High Efficiency Motors
• Variable Frequency Drives
• Boilers/Chillers
• Renewables
• All Other Energy Consumption Sources

• Customer input:
  o Energy/water use & cost, energy related O&M costs
  o Energy goals & wish list of projects
Facility Requirements

• Customer sets standards for building operations
  o Lighting levels, indoor comfort (HVAC)
  o Energy system controls
    – Shut down HVAC during unoccupied hours

• Commissioning
  o Customer/ESCO develop design intent
  o ESCO prepares Commissioning Plan after project design
    – Tests to ensure facility requirements are met
  o Commissioning equipment tests & report
Energy/Water Savings

Measurement & Verification (M&V) Goal – Verify Annual Energy & $ Savings

• M&V Plan (set at contract award)
  o Develop pre-installation energy baseline
  o Measure post-installation performance
  o How energy savings is calculated:
    – (pre-installation baseline) – (post-installation performance)
    – $ Savings = Energy Savings x Energy Rates

• Post Installation M&V Report
  o Demonstrates potential guaranteed savings/year

• Periodic M&V Report (typically annual)
  o Verifies annual guaranteed saving achieved
Determine Energy & $ Savings: Energy Efficiency

Post-Retrofit Energy Use

Baseline Energy Use

Increased Performance

Reduced Operating Hours

Hours per Year
Determine Energy & $ Savings: Renewables

- Reduced Utility Purchase
- Baseline Energy Requirements
- Renewable Energy Supply

Cost
$/kWh

Hours per Year
Risk Management

• Goal: Persistent savings over long term
• Example: Building owner assumes O&M
• Risk:
  o Resources for building owner O&M to deliver savings
  o If performance degrades, ESCO expects full payment
• Benefit:
  o Building owner to consider and manage project risks
  o Increased infrastructure investment
• Risk & Responsibility Matrix (assess range of risks):
  o http://www1.eere.energy.gov/femp/financing/espc_resources.html
  o See 2.3 (MS Word doc)
• Financial, operational, performance issues
Tools for ESPCs

M&V Document Templates:
• M&V Plan
• Post Installation M&V Report
• Periodic M&V Report

Renewable Energy Screening (no cost)
• Pre-project analysis of cost effective RE opportunities:
  o Solar (thermal & electric generation)
  o Wind
  o Biomass (biofuels, thermal, waste-to-energy)
  o Combined Heat & Power
  o Geothermal
Master ESPCs

• Includes common ESPC terms and conditions
• Modify scope of work for specific sites
• 16 ESCOs awarded Master contracts
• Designed for federally owned facilities:
  – Ameresco; Chevron Energy Solutions; Clark Energy Group; Consolidated Energy Solutions; Constellation Energy Projects & Services Group; FPL Energy Services; Honeywell Intl.; Johnson Controls Government Systems; Lockheed Martin Services; McKinstry Essention; NORESCO; Pepco Energy Services; Schneider Electric Systems; Siemens Government Systems; The Benham Companies; Trane
Public/Private Partnerships

• **Agency ESCO selection:**
  o Qualifications/interviews > down select
  o Short list & submit preliminary assessment

• **Conducts at risk, facility survey to identify energy projects:**
  o If not economically viable, no cost to customer
  o If economically viable, develops ESPC project
  o If customer rejects, customer reimburses ESCO costs
  o If customer accepts, ESCO effort part of project cost

• **ESPC project developed and negotiated**

• **Customer acquires infrastructure improvements and facility energy efficiency at no capital cost**
**Business Principles**

- **ESCO Project Investment Thresholds:**
  - Transaction Costs vs. Rate of Return
    - Markup (15-20%), Profit (6-10%)
  - Common target ≥ $1 Million investment
  - Economy of Scale
  - ESPC Scope Considerations
    1. Bundling energy efficiency (EE) & renewable projects
    2. EE & private owned RE projects
       A. Capture tax incentives & state incentives
    3. Non-infinite delivery, infinite quantity (IDIQ) ESPC request for proposal (RFP) for RE Only
ESPCs/Power Purchase Agreements (PPAs) for Renewable Projects

• **Key:** 25-year contract authority less construction time
• RE Project developers seek minimum 20-year PPA
• Office of Management and Budget (OMB)/Council on Environmental Quality (CEQ) 8/16/11 endorses ESPC/PPAs
• FEMP Support to Agency & ESCO
• Private Ownership & Operation of RE Energy Conservation Measures (ECMs) works
  o IDIQ allows ESCO to grant ECM private ownership (H.2)
  o Private party - Federal Tax Incentives (ITC & MACRS)
  o ESPC/PPA terms & conditions
    – Guaranteed Production Requirements
    – Termination schedule
    – Agency License/Easement – Key to financing
ESPCs/PPAs for Renewable Projects

• ESPC/PPA Terms & Condition (cont’d)
  o Owner Warranties
    – PV (25 years), Inverters (10 years)
  o RE Asset Title Issues
    – Government Purchase Option
      ▪ Asset Appraised Value required by IRS
      ▪ Recommend not before 7 years (vest tax incentives)
    – Remove at ESPC expiration (wear & tear accepted)
    – Cannot acquire Asset at $0 cost
  o Consider owner retention > follow on PPA (10 years)
Cash Flow & Parties for Renewable Energy ECMs in ESPC

- Agency
- ESCO
- Financier
- Utility

- Energy Services
- Payments
- Debt Service
- Financing
- Utility Savings
- RE Incentives

- 7
Private Sector Lease

- **Agency**
  - Payments
  - Energy Services
- **ESCO Lessee**
  - Financing & RE Asset Lease
  - Debt Service & RE Lease Payments
- **Financier Lessor**
  - RE Incentives
- **Utility**
  - Utility Savings
  - RE Incentives
Meeting IRS Regulations

IRS Tax Tests:
- Lease Term < 80% useful life
- At lease end asset value >= 20% initial value
- Lessee purchase option – protect Lessor ROI
- Lessor must have 3% cash on cash return
PPA – Deliver RE Power at <= current cost
Private Party Owns RECs

- **Agency**
  - Energy Services
  - Payments
  - Utility Savings

- **ESCO Lessee**
  - ESCO Lessee Payments
  - PPA

- **Financier Lessor**
  - Financing & RE Asset Lease
  - Debt Service & RE Lease Payments
  - RE Incentives

- **Utility or REC Market**
  - REC Revenues
  - RECs Delivery

- **Utility**
  - Tax Credits
  - MACRS
  - IRS

- **Utility**
  - Energy Services
  - Payments
  - Utility Savings

- **Utility**
  - Power Production
  - RE Investment

- **Utility**
  - IRS
Panel Discussion - PPAs within EPSCs

• How to Replicate DHS Success – Day 2 1:30 pm
• USCG – Puerto Rico, Awarded 12/16/10 (3 MW PV)
• FLETC – Cheltenham, MD, Awarded 12/29/11 (2MW PV)

• Panel
  o James Richardson – DHS
  o Bill Bresnick – DHS
  o Wilson Reynolds – Energy Management Engineering, Inc.
  o Doug Dahle – NREL