Designing and Implementing an Award-Winning Energy Management Program at the USPS

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Environmental Energy Technologies Division Seminar
Berkeley, CA
February 19, 2004
USPS/LBNL Functional Area Relationships

- **USPS – Headquarters**
  - Environment
  - Engineering
  - Purchasing
  - Maintenance

- **USPS – Pacific Area**
  - Environment
  - Purchasing
  - Facilities

- **USPS – Other Areas**
  - Environment
  - Purchasing

- **LBNL**

  - $\rightarrow$ Technical Assistance
  - $\rightarrow$ Technical Assistance
  - $\rightarrow$ Technical Assistance
USPS Pacific Area Activities

- Electricity Procurement
- Shared Energy Savings
- Distributed Generation
- Strategic Energy Management Plan

Timeline:
- RFP
- Green Power Contract Awarded (1100 sites)
- UESC
- Develop SES RFP
- Bid Selection
- Statewide Contracts Issued
- PV Installed
- LFG Negotiations CHP Feasibility
- Issued
- District/Area Goals

Years:
- 1997
- 1998
- 1999
- 2000
- 2001
- 2002
- 2003
Principle Obstacles to Success

• Initial expectations - $40 million in savings from competitive electricity markets in 1998 on total national electricity bills of $400 million
• The USPS/Enron golf course agreement
• 40,000 buildings
• Mis-aligned and inadequate authority (facility,district, area, hq)
• Lack of organizational home
• Lack of incentives/consequences
• Distrust of “contractors” / It’s not “Postal”
• Turf issues
• Old facilities
• Last few years – no capital
Utility Shared Energy Savings (SES) Contracts

Utility SES

- Energy savings performance contract
- Sole source to utilities providing energy efficiency services

LBNL Role

- Technical and financial evaluation of project proposals
- Utility rebates/m&v requirements
- Buyout analysis

Examples
- Envest contracts (So Cal Edison)
- PowerPact contracts (PG&E)
- Las Vegas P&DC (Nevada Power)
- Honolulu P&DC (Hawaiian Electric Co)
Competitive Shared Energy Savings Contracts

Competitive SES
- Competitively awarded (restructured states)
- Focus on technology cherry-picking (lighting, motors, motor controls only)
- Contracts awarded in 13 state area, but no projects completed

LBNL Role
- Conduct market research to determine reason for failure and suggest improvements for CA contract
- Technical and financial evaluation of contractor offers
  - Contracts awarded to Viron, now ChevronTexaco - NoCal; Honeywell - SoCal
- Technical and financial evaluation of project proposals
  - >$10M in projects awarded/completed; expected total >$70M over 4 year contract life
Distinguishing Features of USPS CA SES Contract

- Audit risks borne by ESCO
- Single ESCO per facility
- No “cherry-picking” – all technologies considered
- Performance risk borne by USPS
- Some key issues still being resolved
  - Use of savings in excess of 100% in a given year provided NPV is positive
  - Service level adjustments to baseline
  - Modeling out-year energy prices
  - Extend Delivery Order term to 25 years
Commodity Procurement

- Electricity procurement (CA, NY, NJ, IL, national)
- Green power procurement (CA, NY)
- Comprehensive energy services (national)
Purchasing Green Power in CA

- Creating realistic expectations of potential savings
- Developing senior management support
- Designing the solicitation
- Evaluating the offers and negotiating with potential suppliers
- L’Affaire Enron
- Offer lost in a merger
- Awarding a contract – 100% renewable, ~1100 sites, no price premium (~4aMW)
- Then-largest federal green power purchase
Developing a PV Demonstration Project

- FEMP DER grant of $125k received on the basis of original plan – 4 sites @ 25kW
- Conducted market research
  - Price: $9 – 9.50/W @ 25kW; $8.50/W @ 100kW
  - Rebates: CEC - $4.50/W up to 50%; LADWP - $5/W, no limit, manufactured in LA (lower for other products)
- Non-competitive procurement approved – PowerLight PowerGuard product
  - No roof penetration
  - Manufactured in LA – higher rebate
- Site Selection
  - LADWP rebate program
  - Tariff, roof, site cooperation
  - 3 candidate sites
- Use of expense funding approved for 100 kW
Developing a PV Demonstration Project (cont.)

- LADWP increased rebate to $6/W
  - PowerLight increased size to 127W (nameplate)
  - Rebate $684,000 (based on 114kW actual)
- Cost to USPS: $225,000
  - 9 year ROI
- LADWP self-gen tariff substantially increased benefits
  - 7 year ROI
- System included Data Acquisition System and Solar Load Controller
- Led to newly-approved 400kW system in W. Sac.
127 kW Nameplate PV System at USPS Marina Processing & Distribution Center
PV Data Acquisition System
Favorable Recognition for the Client

David Wiggs,
Ageleina Galiteva,
LADWP

Gord Handelsman
Siemens Solar

Debra Bowen,
State Senator

Dan Shugar
PowerLight

Winston Hickox,
Secretary,
CalEPA

Ruth Galanter
LA City Council

Beth Shearer
Director, FEMP
Design Assistance

• Comprehensive Review of USPS Construction Design Standards
  - Recent request from USPS Facilities Department
  - Earlier reviews not influential

• Development of Large Facility Lighting Design Guide

• Development of Small/Medium Facility Lighting Design Guide

• Proposed Santa Monica Green Building

• Technology case studies
  - Compressed Air
  - Carrier case lighting
• Pacific Area tele-metering and demand response program
  
  - Installation of energy information and demand response systems at 24 CA large facilities
  
  - Sole sourced to Viron Energy Services (now ChevronTexaco)
  
  - Funded entirely by CEC grant ($1.2M)

• National tele-metering program

  - Developing technical specifications and business case
Tele-metering: Building a Business Case

- Establish baseline technologies/services
- Determine incremental investment required
- Evaluate sources of potential benefits (high/medium/low cases)
  - More effective electricity and gas commodity procurements
  - Improve facility operations & maintenance (O&M)
  - Improve energy efficiency retrofit project design
  - Tariff analysis
  - Reduce utility billing errors
  - Evaluate potential from economic demand response (programs and/or prices)
  - Evaluate potential from participation in demand response programs (grid emergency)
- Calculate return on investment
Lighting technology design ("Rodeo" or carrier case fixture)

Lighting design guides
  - Retail operations
  - P&DCs

Berkeley Lamp test-bed
Direct Financial Benefits

- Tariff analysis - $200K refund from SDG&E for overbilling
- CEC grant - $1.2M for demand response system
- LADWP rebate - $684K for Marina PV system
- FEMP grant - $125K for Marina PV system
- PG&E Self-Gen Incentive Program rebate - ~$2M for W.Sacto PV system
- Various smaller utility rebates
The Strategic Energy Management Plan

- Heart of the energy program
- Defined organizational structure, responsibilities
- Senior management support
- Established goals
- Tools provided
- Reporting incorporated
## Energy Consumption Tracking Database

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Energy Consumption Reporting

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Key Success Factors

- Meeting the people/learning the culture
- Finding a champion
- Focusing on the needs of the USPS
- Gaining recognition for the client (press coverage, awards, etc)
- Bringing supplemental resources (FEMP co-funding, state/utility rebates, etc)
- Patience and persistence/navigating roadblocks
- Gaining credibility/delivering the goods
- Striking when the iron is hot
- Looking for opportunities
- Picking your battles (and your timing)
Energy Program Awards

- DOE Federal Energy and Water Management Award (2003, 2000)
- CA Governor’s Environmental and Economic Leadership Award (1999)
- “Honorable Mention” USEPA Green Power Leadership Award (2000)
- Presidential Award for Leadership in Federal Energy Management (2003)