



Paying for **Green** Government
Guaranteed **Energy Savings:**
Case Study

City of Greensboro

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Project Team



- City of Greensboro
 - Butch Simmons, Director Engineering & Inspections
 - Butch Shumate, Manager Facilities Engineering
 - Fred Ridge, Central City Services Manager
 - David Howell, Building Maintenance Manager
- Pepco Energy Services
 - Various / Many
- Independent Consultant
 - Derrick Giles, ENPULSE Energy Conservation

Why Performance Contract?



- Maintenance Bond Referendum Failed
- No Capital Improvement Budget – 4 Years
- Success of Coliseum Project
- No General Fund Money Required
- No New Taxes Required
- City Manager & City Council Support

RFP Process



- Include the Critical
- Avoid the Unnecessary



Selection Process



- Review Proposals
- Short List / Not?
- Oral Interviews
- Site Visits / Talk to Past Customers
- Make Selection

Process of a Performance Contract



- Construction Level Audit
 - ✓ Energy Conservation Measures identified
- Financial and other criteria to Applied
 - ✓ Energy Conservation Measures prioritized
- Contract Signed
 - ✓ Scope of Work “Finalized”
 - ✓ Measurement & Verification Plan Defined
 - Need to be Able to “Measure” Savings

Scope of Work



- Lighting
- HVAC / BAS
- Water
- Incorporate “Green” Solutions
- Optimize Existing Systems
- Focus on Scope, Not Dollars

General ESCO Comments



- Performance Contracting is a Good Tool
Off-Budget Capital Acquisition
- READ the **CONTRACT**
Details, Details, Details ...
- ESCO's are **BUSINESSES**
Maximize Profit
Minimize Risk
Partnership Needs to Align Common Interests
- Construction Issues

Purpose of a Performance Contract?



- Install energy savings equipment to be paid for through the savings
- Replace retiring energy intensive equipment with new energy efficient equipment

Performance Contracting



Strength

Off-Budget Capital Acquisition

Opportunity

Specialized Technical Knowledge

Speed of Installation

Limited Commitment of Manpower

Broad Staff & Public Awareness

Weakness

Long Term Debt Obligation

Threat

Unfamiliarity with ESCO Process

Avoided Cost vs. Savings

Un-measurable Savings

Unrealized Avoided Costs?

Measurement & Verification



- Are Savings Being Achieved?
 - ✓ If not, why not?
 - ✓ Fix it!
- Baseline Data
 - ✓ As Much & as Fine a Detail as Possible
 - ✓ For as Long as Possible
- Early M&V
 - ✓ When it is Gone, it is TOO LATE!
- Indirect / Interactive Effects
 - ✓ Impacts on Designs and M&V

International Performance Measurement and Verification Protocol (IPMVP)



Option A

Retrofit Isolation:

Key Parameter Measurement

{Representative Sampling

And/or Stipulated}

Option B

Retrofit Isolation:

All Parameter Measurement

{Fully Metered Savings}

Option C

Whole Facility Measurement

Option D

Calibrated Simulation
{Building/System Modeling}

International Performance Measurement and Verification Protocol (IPMVP)



Option A

{Representative Sampling
And/or Stipulated}

- Lighting 41%
- Re-commissioning HVAC 11%
- Energy Awareness Program 10%
- Water 6%

Option B

{Fully Metered Savings}

- Cooling Tower Deduct Meter
1.7%

Option D

{Simulation & Modeling}

- Update BAS 19%
- HVAC Improvements 6%
- Other 6%

**44% Weather
Dependent**

M&V Example



- 80% Confidence with 20% Precision
- 1,590 Fixtures {requires only 3 Readings}
 - 2 Lamp T12 72w
 - 2 Lamp T8 LP w/ 28 Watt Lamps = 44w
 - Savings = 28w (or between 5w & 51w)
- Normal Distribution & Random Sampling
- Building Simulation Modeling

Financial Evaluation Criteria for a Performance Contract?



➤ (Simple) Payback

- ✓ Simplest & Most Widely Used
- ✓ Most Misunderstood & Misapplied
 - **Danger - Use at Own Risk!**

➤ Life-Cycle Analysis

- ✓ Net Present Value (NPV)
 - Scale of Benefits
- ✓ Benefit/Cost Ratio (B/C)
- ✓ Return on Investment (ROI)
 - **Greensboro Parking Decks**

City of Greensboro



➤ Lessons Learned

- ✓ Carefully Word RFP
- ✓ Focus on Scope not Dollars
- ✓ **FIRST** Establish the Baseline

➤ Future Goals

- ✓ Complete Energy Management Plan (on-going)
 - ✓ Sub-metering, Energy Modeling & Forecasting
- ✓ Additional Conservation Measures
 - ✓ Phase 2 of Performance Contract?