

# Energy Efficiency Services Strategies in Public/Institutional Sector Buildings

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International Workshop on Energy Efficiency Services Industries  
Shanghai, China  
September 2003

# Topics

Topics

Barriers in the  
Public Sector

Enabling  
Policies

"Best  
Practice"  
Models

"Success"  
ingredients

Technical  
Opportunities

Case Studies

- Barriers in the Public Sector
- Enabling Policies "Best Practice" Models
- "Success" ingredients
- Technical Opportunities
- Case Studies

# Barriers to Energy Efficiency in the Public Sector

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Topics

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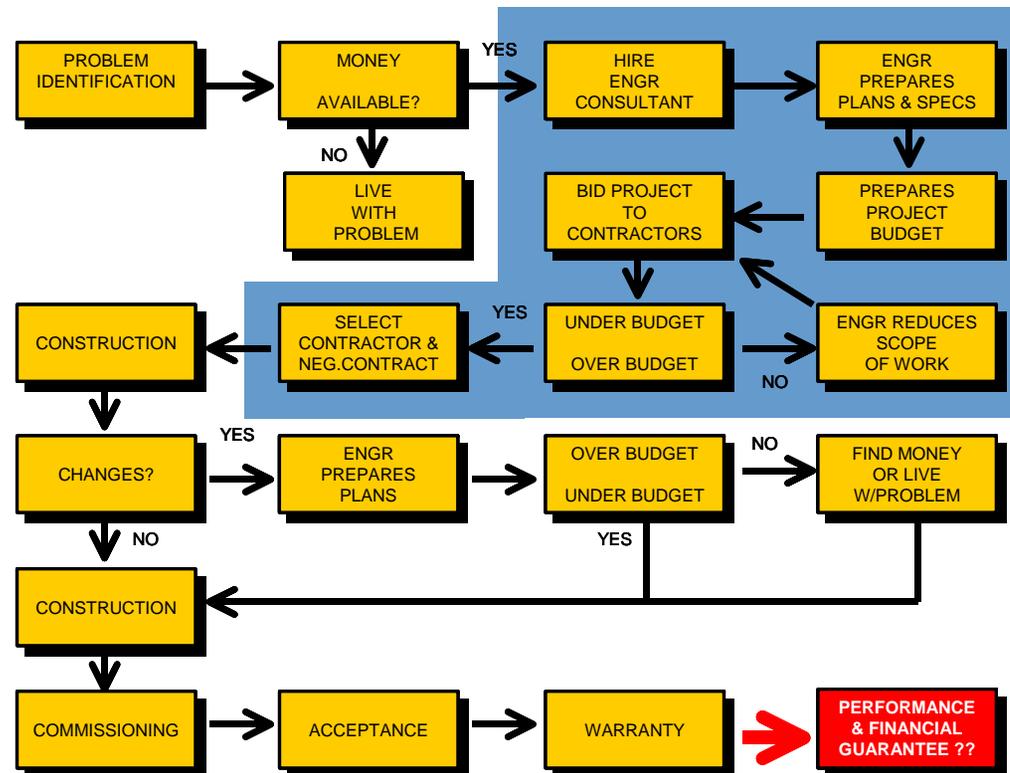
Case Studies

- **Legislative**
  - Laws preventing long- term contracts
- **Procurement Laws**
  - Lowest Bid versus Value Based
- **Financial**
  - Laws preventing long term debt
- **Decision Making Processes**
  - Un-informed buyers
  - Risk adverse
  - Slow decision
  - Many "buyers"

# Barriers to Energy Efficiency in the Public Sector

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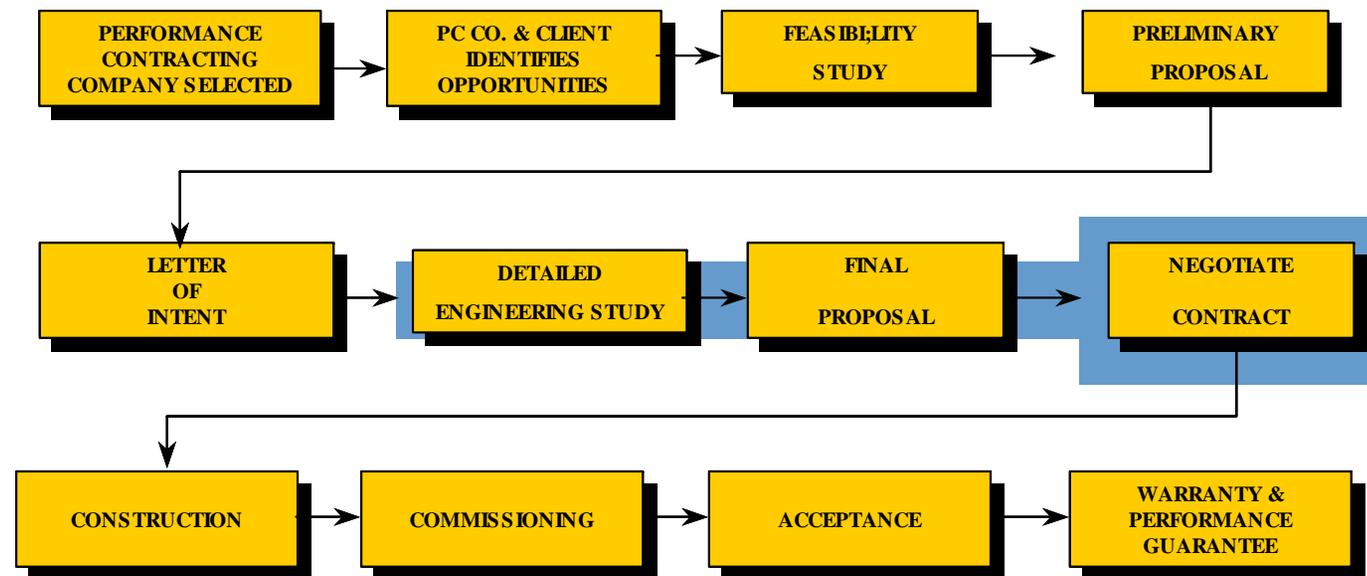
- Procurement Laws requiring Lowest Bid versus Value Based



# Enabling Policies to Facilitate Performance Contracting

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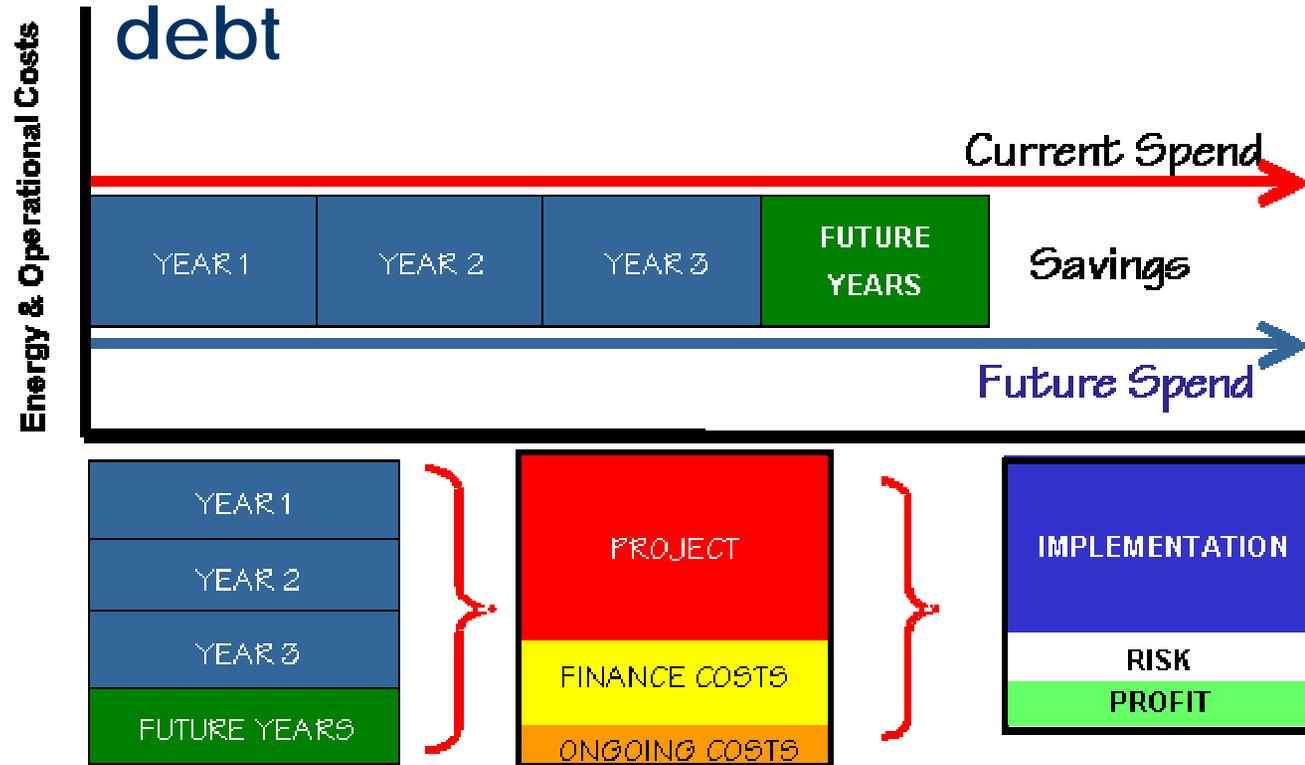
- Procurement Laws allowing Value Based versus Lowest Bid



# Enabling Policies to Facilitate Performance Contracting

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- Financial -Laws allowing long term debt



# "Best Practice" Models of Performance Contracting Programs

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- **State of New York & State of California**
  - Enabling and Encouraging Legislation
    - ◆ Laws
    - ◆ Goals / Mandates
  - Expanded Term of Contracts
    - ◆ 12-15-18 years
  - State Funding Contributions
    - ◆ Significant, technology based
  - Broader Definition of Allowable Technologies

## "Success" Framework / Advantages of energy efficiency projects in the Public Sector

### Needed Framework

- Enabling Legislation
- Encouraging Legislation
- Clear Goals and Timelines
- Local Champions
- Strong ESCOs
- Financial Providers willing to support long-term energy projects
- Patience

### Advantages

- Program works with existing budgets
- Limited capital funding required
- Risk Avoidance - Shifts risk to ESCO
- Allows clients focus on core challenges
- Saves money & Save time
- Guaranteed financial results

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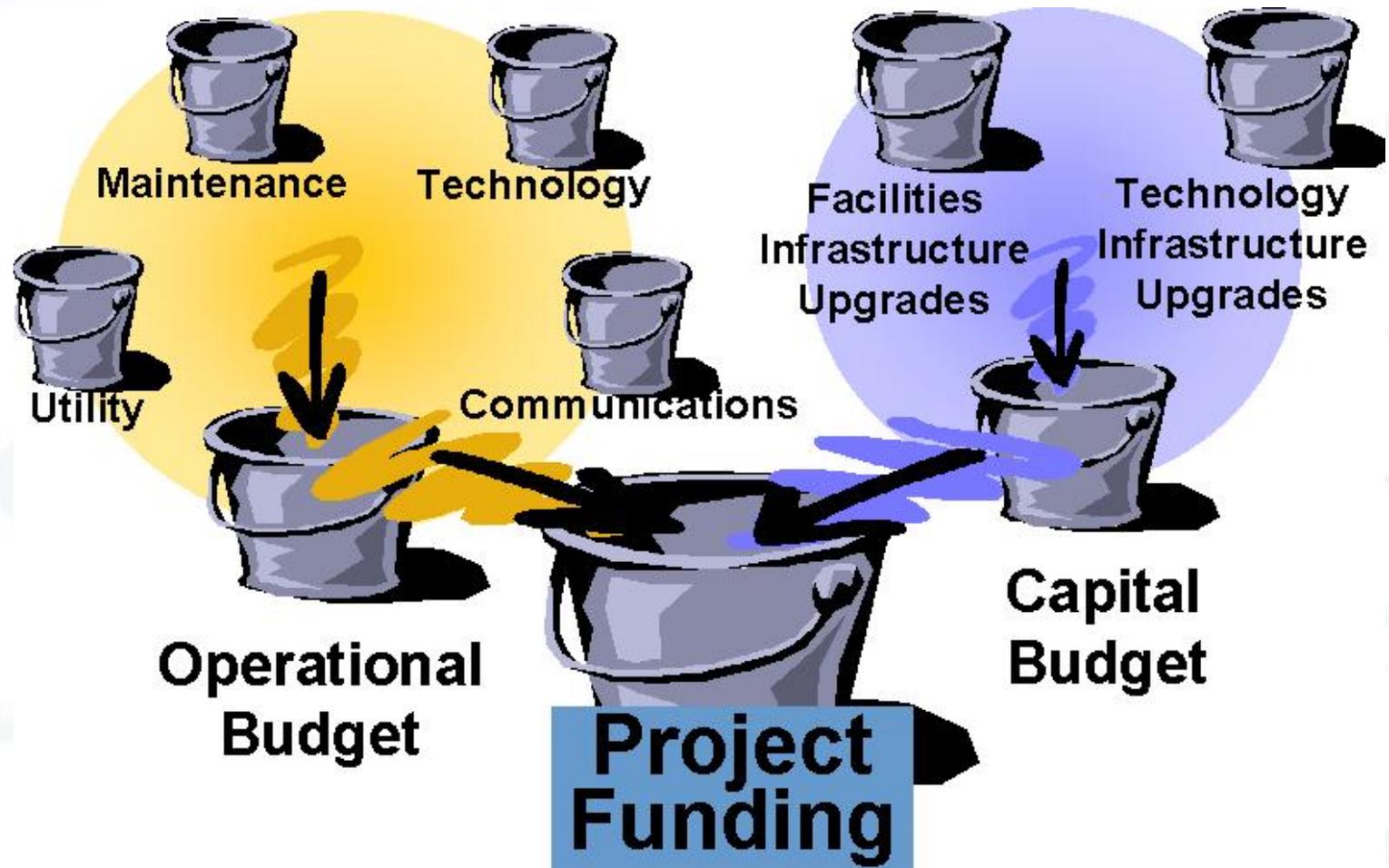
Technical Opportunities

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# Technical Opportunities

# The Opportunity Buckets



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# Technical Solutions



## ■ Energy

- Boiler optimization
- Chiller plant optimization
- Lighting retrofit
- Energy management systems
- Equipment modernization
- Windows and roofs
- Laundry
- Motor efficiency
- VAV conservation

## ■ Operational

- Utilities procurement
- Water conservation
- Service contract consolidation
- Staffing
- Waste removal
- Relamping
- Submetering

# Energy Profiling – Primary Education

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## ■ Electricity

- Lighting 46%
- Ventilation 25%
- Space Heat 8%
- Air Conditioning 1%
- Miscellaneous 20%

■ Savings potential 19%

## ■ Fuel (Natural Gas)

- Space Heat 45%
- Ventilation 35%
- DH Water 3%
- Miscellaneous 17%

■ Savings potential 14%

Reference:

American School &  
University (AS&U)  
Magazine

# Energy Profiling – High Schools

## ■ Electricity

- Lighting 56%
- Ventilation 21%
- Space Heat 1%
- Air Conditioning 4%
- Cooking Equip. 2%
- Miscellaneous 16%

■ Savings potential 25%

## ■ Fuel (Natural Gas)

- Space Heat 60%
- Ventilation 33%
- DH Water 1%
- Cooking Equip 1%
- Miscellaneous 5%

■ Savings potential 31%

Reference:

American School &  
University (AS&U)  
Magazine

Technical  
Opportunities

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# Energy Profiling – Higher Education

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- **Electricity**

- Lighting 40%
- Ventilation 36%
- Air Conditioning 16%
- Miscellaneous 7%

- **Fuel (Natural Gas)**

- Space Heat 35%
- Ventilation 65%

■ Savings potential 17%

■ Savings potential 25%

Reference:

American School & University (AS&U) Magazine

# Case Studies

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**Case Studies**

# Advocate Health Care – Chicago, IL

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- **Overview**
  - Project includes eight hospitals and two children's hospitals with 3,076 beds
- **Client Goal**
  - The goal is to assure continued maintenance of Advocate's existing energy procurement savings, while incrementally improving the organization's utility management savings by another 3-4% per year.
- **Siemens Building Technologies (SBT) Solutions**
  - Strategic energy planning
  - Energy procurement and contract management
  - Utility bill analysis and exception review
  - Strategic energy information and performance reporting, including load profiling services
  - Serve as Advocate Health Care's technical advisor on all decisions relating to energy purchase and usage for ongoing operations, renovations, additions and new construction at each of its eight hospitals
- **Results**
  - SBT helped Advocate Health Care take advantage of utility deregulation in Illinois by procuring electricity and gas competitively.
  - Energy procurement savings in the first year are expected to exceed one million dollars.

**Annual Savings >\$1.0 M**

# Dearborn County Courthouse – Indiana

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- **Client Objective**
  - A 100+ year-old courthouse in Indiana was in need of considerable upgrades.
  - The architectural firm's feasibility study recommended either a new county office building or a \$9-million courthouse renovation
  - Dearborn County commissioners had to come up with yet another solution.
- **Siemens Building Technologies Solution**
  - SBT structured financial package so that much-needed upgrades were funded without any additional tax burden to residents in the community.
  - The \$4.8-million Performance Solutions program included:
    - ◆ New building controls and HVAC system, including central heating and cooling
    - ◆ Installation of a new data communications network for the existing phones and computers
    - ◆ Installation of a new fire alarm, security and electrical systems
    - ◆ Bringing the building up to code (including electrical, Indoor Air Quality and ADA compliance in the public restrooms)

# University of Texas (UTEP)

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- **Overview**
  - Univ. of Texas – El Paso (UTEP) is a campus in University of Texas system
  - 15,000 students plus 3,400 academic faculty and staff
  
- **Key Achievements:**
  - Projected energy savings to top \$1.65 million annually
  - Project financed 100 percent out of guaranteed energy savings
  - Negotiated new electric rates
    - ◆ Reduced electric utility campus rate by more than 29 percent, from 8¢ to 5.6¢ per kWh
    - ◆ Reduced off-peak rate by more than 51 percent, from 8¢ to 3.9¢ per kWh
  - Enhanced the quality of the learning environment, and increased comfort levels substantially
  - Enabled major facility improvements that would have otherwise been financially unfeasible
  - Continually lowered overall operating and maintenance costs, and Relieved the university of the responsibility for rebuilding and operating an aging thermal plant

**Annual Savings >\$1.65 M**

# St. Joseph's Hospital and Medical Center - Paterson, New Jersey

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## ■ Overview

- St. Joseph's Hospital is New Jersey's largest private medical center and Passaic County's biggest private employer, providing high quality health care to approximately 23,000 inpatients and over 200,000 outpatients annually.

## ■ Client objectives

- Reduce energy costs.
- Enhance the total environment of care.
- Improve operating efficiencies

## ■ Siemens Building Technologies Solutions:

- Performed an in-depth energy and operations audit to identify opportunities for improvements in HVAC, lighting and temperature control and feasibility study for a new electricity and steam cogeneration plant.
- Designed and installed a new cogeneration plant to generate supplemental electricity for the complex and provide steam for heating and absorption cooling.
- Retrofitted over 7,300 lighting fixtures as needed to reduce energy usage and waste

## ■ Results:

- Annual energy savings to exceed \$1.5 million: \$15 million over 10 years
- Positive 10-year cash flow projected to exceed \$1.8 million
- Improved the total environment of care for patients, physicians and employees
- Reduced temperature-related complaint calls and increased comfort levels significantly
- Improved lighting levels
- Optimized use of existing plant equipment

**Annual Savings >\$1.5 M**

# University of Calgary - Calgary, Alberta

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- University of Calgary in Canada has 23,000 students involved in academic, cultural and sports activities.
- Key Achievements:
  - Reduced campus electric utility charges by over \$150,000 annually through power factor correction
  - Lowered energy costs and CO<sub>2</sub> emissions in one building by over 50%
  - Projected total savings for all Phase I projects to exceed \$5.8 million in 10 years.
  - Guaranteed savings provide funding for facility improvement projects.
  - Lowered overall operating and maintenance costs, and extended life cycles of equipment
  - Improved indoor lighting levels via lighting equipment retrofits
  - Increased occupant comfort levels and indoor air quality substantially
  - Enhanced the quality of the learning environment
  - Reduced emissions to the environment via less energy use
  - Completed major improvements to the campus infrastructure
  - Lowered overall operating and maintenance costs
  - Achieved centralized control and monitoring of building systems

Annual Savings >\$600K

# Additional Information

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**ENERGY**