

BEYOND

SMART CITIES

ENERGY SAVINGS PERFORMANCE AND

MEASUREMENT & VERIFICATION

ONLINE TRAINING COURSE

KRISHNAJI PAWAR, LEED AP BD+C, GSAS CGP, ISO 14001:2015, GCP

ENERGY SPECIALIST CURRICULUM





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BEYOND

SMART CITIES

ALTERNATIVE FINANCING

FOR ENERGY PROFESSIONALS

KRISHNAJI PAWAR, LEED AP BD+C, GSAS CGP, ISO 14001:2015, GCP

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WHAT SHOULD YOU LEARN



Why alternative financing

General Financing Alternatives

Performance Contracting Aspects

Energy Savings Measurement & Verification





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## WHY ALTERNATIVE FINANCING?

- ✓ Takes \$ to Save
- ✓ \$ Available Resources & Programs
- ✓ May be the Only Way ...



## 4 BASIC WAYS TO FINANCE

- ✓ Equity
- ✓ Borrow
- ✓ Lease
- ✓ Performance Contracting

- ✓ Equity
  - ➔ Simplest
  - ➔ Usually LCC Effective
  - ➔ Owner Assumes All Risk
  - ➔ Borrowing Yields Better LCC If Interest Is Less than Return on Investment (IRR)



## 4 BASIC WAYS TO FINANCE +

- ✓ Borrow
  - ➔ Many Resource Options
  - ➔ Owner Assumes All Risk



#### 4 BASIC WAYS TO FINANCE +

##### ☒ Lease

⇒ True Lease / Rental

• Tax Deductible

• Won't Own at End of Term Capital Lease Can Depreciate Asset  
Agree to Buy at End of Term ("rent to own")

⇒ How leases are treated depends on the tax laws of individual countries



#### 4 BASIC WAYS TO FINANCE +

##### ☒ Definition

☒ Contractors

☒ Financing Costs

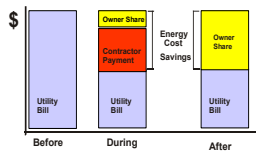
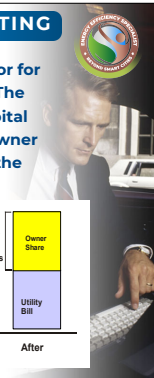
☒ Benefits vs. Risks



#### DEFINITION OF PERFORMANCE CONTRACTING

A contract between a building owner & a "ESCO" contractor for the purpose of saving energy \$ in the owner's building(s). The contractor agrees to research, design, build & maintain capital improvements which are expected to save energy \$. The owner agrees to pay the contractor from savings realized during the contract period.

☒ The contractor must "perform" via energy \$ savings in order to be paid...



## TERMS USED IN THIS COURSE

- ✓ **Simple Payback (SPB or SPP)** is the number of years before the savings “payback” the investment.

$SPB = \text{Investment} / \text{Net Annual Savings}$  Example: A project has an investment of \$100,000. Savings per year are \$22,000 but added maintenance because of the project is \$2000.

**What is the SPB?**

Note: SPB does not consider interest and ignores what happens after the payback period. Thus, SPB is not an accurate decision criterion; but everyone understands it (or think they do) and will likely always have it around. Used in proper fashion, SPB is not a bad “first cut” tool.

- ✓ **Salvage Value** is the value of the equipment at the end of the project life. Sometimes salvage value is positive and sometimes it is negative. Salvage value is usually ignored in this section.

## 3 CLASSIC STRUCTURES

- ✓ **Shared Savings**

⇒ Documented Savings are Shared

- ✓ **Guaranteed Savings**

⇒ Monthly Payments Made Based on Savings Projections with Periodic Reconciliation Against a Guaranty

- ✓ **Chauffage**

⇒ Consistent Monthly Cost for Provision of Comfort, Illumination, etc.

## CONTRACTORS

- ✓ **Energy Savings Performance Contractors (“ESCOs”)**

⇒ Utility Companies

⇒ Manufacturers

⇒ Independents

- ✓ **Services**

⇒ From Initial Audits to On-Going Maintenance



## FINANCING COSTS



- ✓ Quantified by Treasury Points
  - Set by London Inter-Bank Offering Rate (LIBOR)
  - Typical = Treasury Rate + 175-225 Treas. Points (around 5.5 - 7.5% fixed APR up to 20 years)
  - Terms Locked at Construction Completion
- ✓ Lender's Risk Assessment
  - Contract Terms
  - Project Complexity
  - Client Creditworthiness



## BENEFITS VS. RISKS

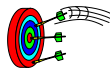
(Owner's Perspective, vs. Equity)

- ✓ Benefits:
  - Neutral or Positive Cash Flow
  - Contractor Performance Incentive
  - Maintenance Added Value
  - May be the Only Way?
- ✓ Risks:
  - Complicated Process
  - Long Term Commitment



## REVIEW

- ✓ Financing Alternatives
- ✓ Performance Contracting
- ✓ M&V



ALTERNATIVE FINANCING (ADDITIONAL )

ALTERNATIVE FINANCING

Additional information for ESCO workers,  
and is not on the CEM test



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A person in a white lab coat is shown from the chest up, interacting with a futuristic, glowing blue cityscape interface. The interface features a globe and various city buildings. The text "BEYOND SMART CITIES" is prominently displayed in the upper left, and "THANK YOU" is in the center. A circular logo in the upper right corner reads "ENERGY EFFICIENCY SPECIALIST" and "BEYOND SMART CITIES".

**BEYOND**  
SMART CITIES

THANK YOU

ENERGY EFFICIENCY SPECIALIST  
BEYOND SMART CITIES

**THE WORLD'S 1ST GREEN TECHNOLOGY  
MARKETPLACE**

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