

Financial Considerations in Planning and Implementing an Energy Efficient Installation

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Presentation Topics

- ESCOs and performance contracting defined
- Solutions oriented
- Client lifecycle approach
- Technology enablers
- Project case studies

What is an ESCO?

What is PC?



- **ESCO: Energy Service Company**

- Comprehensive energy services
- NAESCO: National Association of ESCOs

- **Performance Contracting Defined**

- Leveraging guaranteed energy savings to fund facility improvements
- Savings generated from energy conservation measures (ECMs)
- Function of long-term sustainability and energy efficiency

The ESCO Market



- Opportunity

- Buildings account for ~40% of global GHG emissions,
- Buildings represent up to 70% of electricity consumed

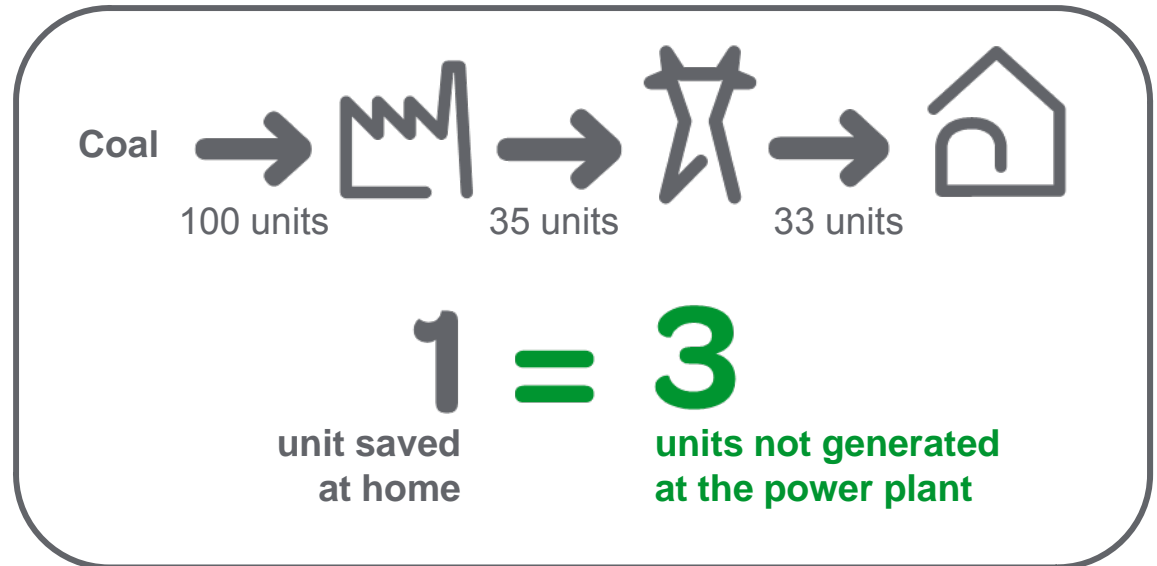
- Lifecycle Cost

- 75% of costs of buildings occur after construction is complete

- Frost and Sullivan Research

- 75% of ESCO work is performance contracting
- PC market is \$3.9B to \$4.25B in size
- Federal market is fast growing segment (currently 10-20%)
 - Education, state and local governments also 20-30% each
- Decision-maker is typically a political body

Benefits of Energy Efficient Solutions



- Cheaper

- Quicker

 - Technology is available today with short-term results

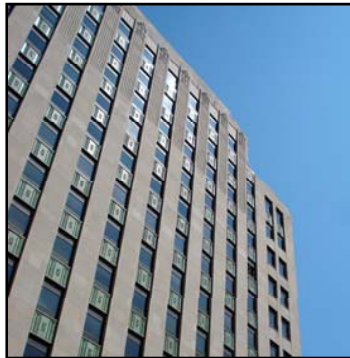
- Cleaner

 - “Negawatt” produces no environmental footprint

- Enhanced security

 - EE is homegrown, it reduces dependence on imports

How Does PC Work?

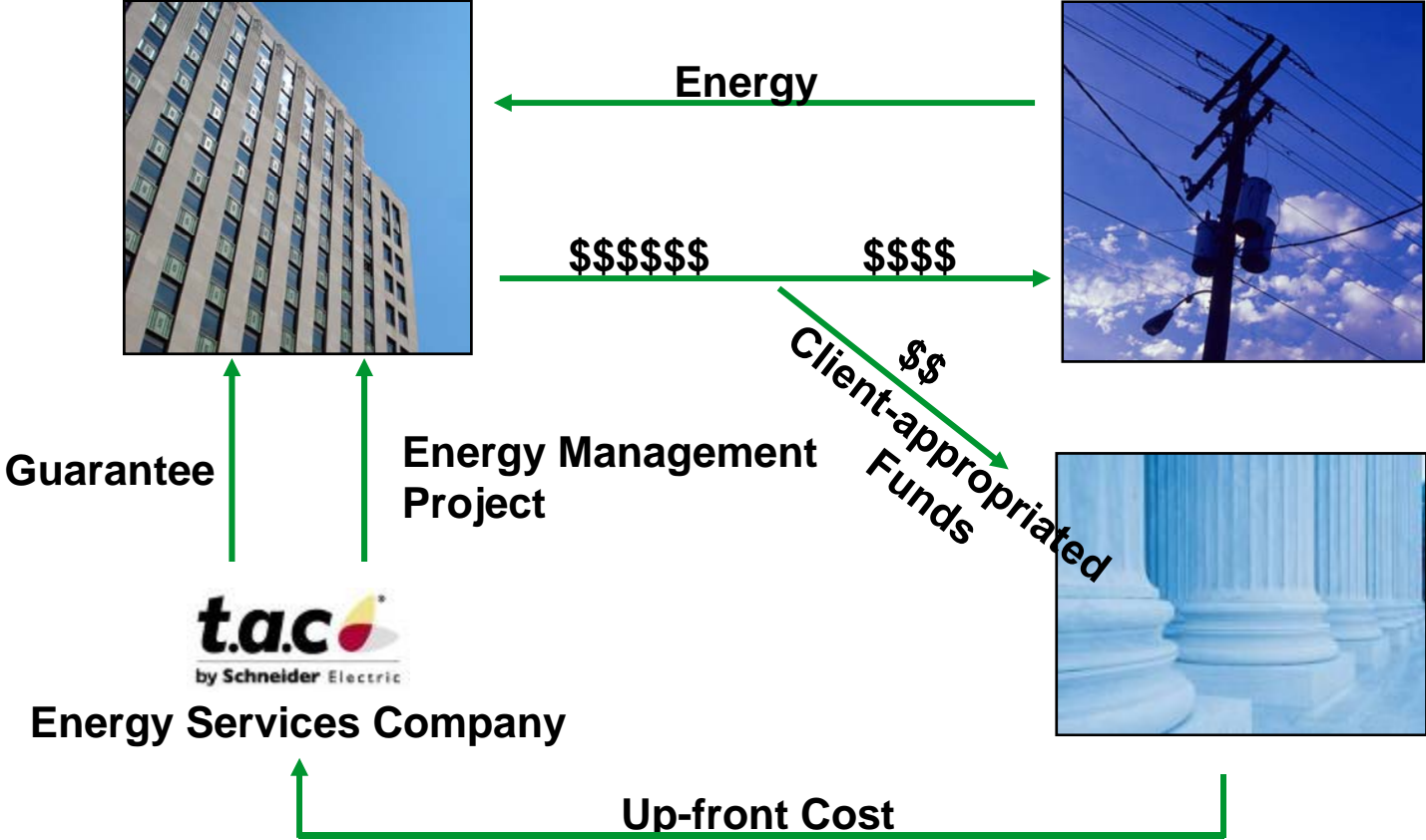


← **Energy** →

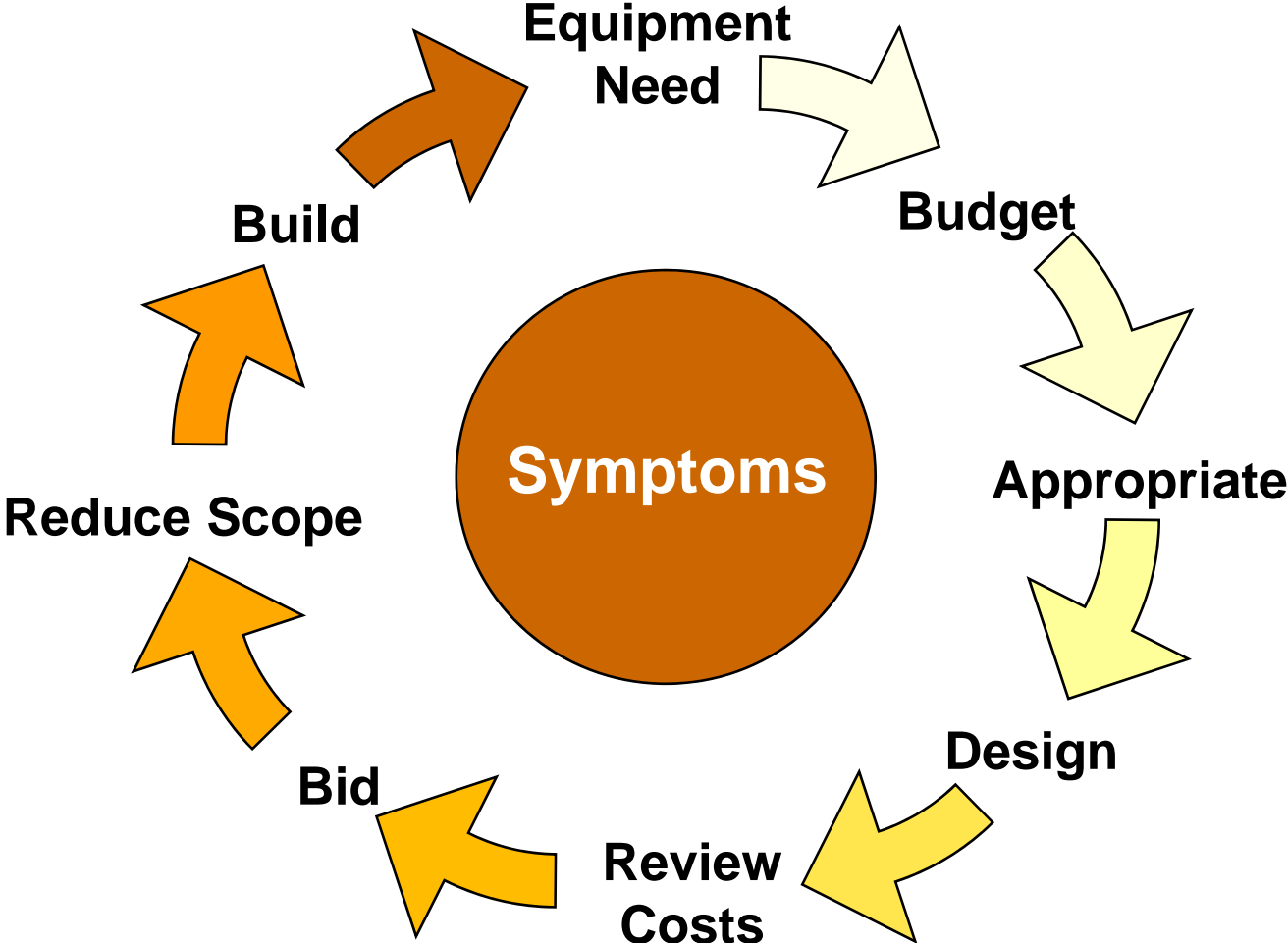
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How Does PC Work?



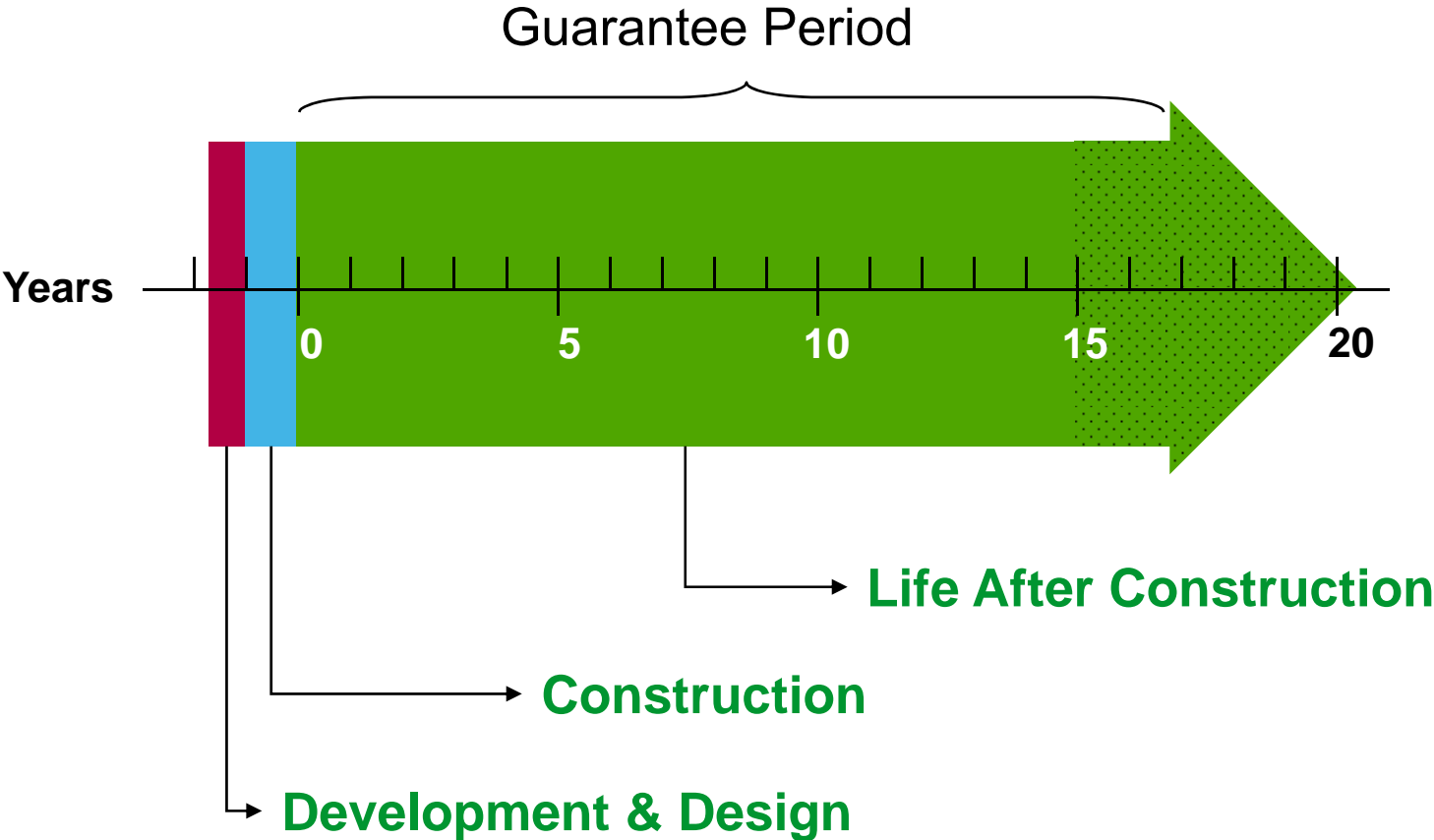
Classic Procurement Scenario



Breaking the Cycle



ESCO Process



Client Lifecycle Approach: Expertise Necessary

On-Site Renewable
Energy Systems



Advanced
Building Envelope



Innovative Energy
Efficient Equipment



Optimized Building
Use through Automation
and Control



Integrated design
and performance
based construction



Energy
Benchmarking,
Measurement &
Verification



Lifecycle Services for
Continuous Performance



Comprehensive
Energy Savings, M&V



LED Application: Recessed Downlight

Energy Savings



Fixture Performance Comparison			
LED 24W-WH	VS.	Incandescent 65W BR-30	CFL 26W Triple Tube
Fixture Summary			
IC22LED-35K-24W-WH	Housing and Trim	IC2-24W-WH	ICPL626E-2330W-WH
14W LED	Lamp Specification	65W BR-30	26W Triple Tube
14W	Total Input Watts	65W	25.3W
50,000	Lamp Life (hrs.)	2,000	12,000
0.37W/FT ²	Watts Per Square Foot	1.81W/FT ²	0.70W/FT ²
No	Energy Star/T24 2005 Compliant	No	Yes
Illuminance Summary			
16.9fc	Average Illuminance	16.1fc	16.6fc
3:1	Uniformity Ratio (Max/Min)	4:1	3:1
Operating Cost Summary			
\$3.91	Annual Energy Cost Per Fixture*	\$18.98	\$7.39
\$0.00	Annual Relamping Cost Per Fixture**	\$4.70	\$3.20
\$3.91 Per Fixture x 9 Fixtures = \$35.19	Annual Operating Costs	\$23.68 Per Fixture x 9 Fixtures = \$213.12	\$10.59 Per Fixture x 9 Fixtures = \$95.31
	Annual Savings for a 9 Fixture Layout	\$177.93	\$60.12

*Total input watts x 8 hours/day x 365 days/year x \$0.10/KWH/1000

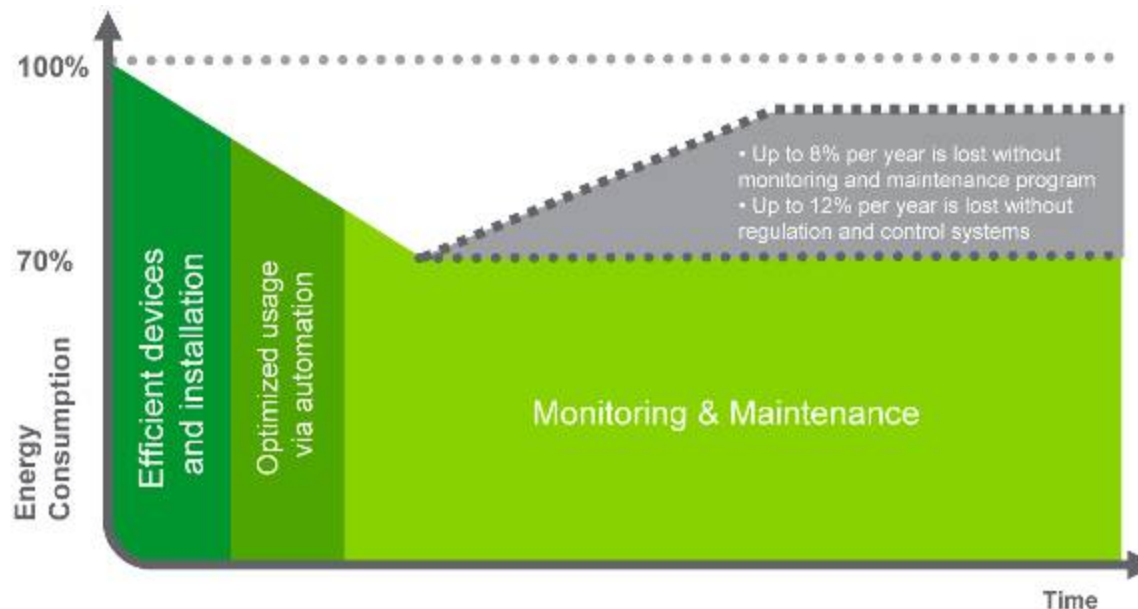
** Replacement cost per lamp x annual hrs. of operation/lamp life

Sustainable Performance



- Savings might be lost quickly due to:

- Unplanned, unmanaged shutdowns of equipment and processes
- Lack of automation and regulation (motors, heating)
- No continuity of behaviors



Control and monitoring technologies will sustain the savings

Intelligent Services



● Predictive Maintenance

- Identify problems and troubleshoot solutions
 - Fix before reported issue or failure occurs
- Can be notified through automated work order systems or energy call centers

● Energy Remote Monitoring

- Understand their energy use
- Take appropriate action
- Improve energy efficiency
- Optimize building performance

Focus on End-to-End Services

Analyze



Rebates & Incentives

Supply Side
DRP

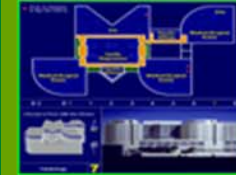
Metering
Energy Intel

Develop & Implement



ECM Retrofits
VSD, Lighting, BAS, etc.

Motivate



Behavioral
Modifications

Sustain



On-going
Services

ESCO's Capabilities: Valuable Across Spectrum

• True building lifecycle solutions

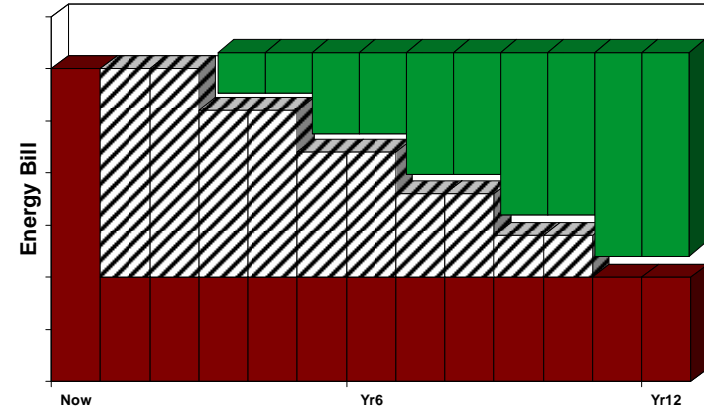
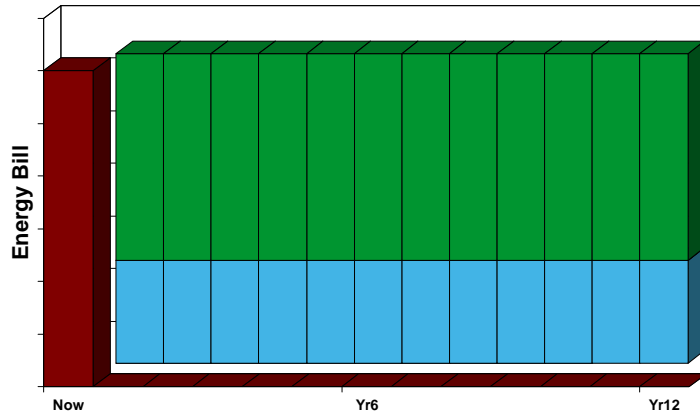
- Core design-build/preemptive performance contracting
- Infrastructure (including master planning)

Value of PC



- Comprehensive improvements vs. low-hanging fruit
- Financial tool for achieving energy efficiency upgrades
- Concept of sustained performance
 - Fifteen/twenty year guarantee reconciled annually
 - Partner with ESCO for sustainable performance (guarantee is tied to performance of engineering of project)
- ESCO becomes trusted business partner
 - Understanding clients and what drives their business
 - Counseling on green and sustainability issues
 - Transforming clients' business through triple bottom line

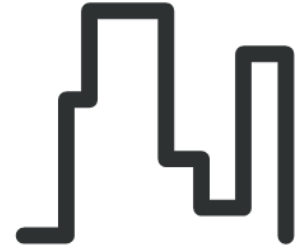
Additional Considerations



- Today's Construction Prices
- Reduced Deferred Maintenance
 - Control Over Equipment & Subcontractors
 - Funding Always Available
 - Proper Commissioning
 - Consistency

- Future Increases
- Maintain or Lose Ground
 - Low Bid Contracting
 - Priority Funding
- What Commissioning?
 - "Hodge Podge"

Case Study: Eudora Public Schools (KS)



●The Challenge:

- Board losing credibility over previous construction projects relative to quality, cost and performance
- Rising utility bills
- “We’re tired of building these buildings wrong and having to have TAC fix them.”

●The Solution:

- Pre-emptive guaranteed-performance building retrofit
- TAC ES is direct to owner and peer to architect on district’s bond program, wholly responsible for design, installation, commissioning and building performance after construction (utility spend, comfort) for 15 years


Our mission is to

Help people make the
most of their energy



What We've Covered Today

- ESCOs and performance contracting defined
- Typical solutions
- Client lifecycle approach
- Technology enablers
- ESCO project case studies

Schneider
 Electric