Creating Partnerships, Building Bridges

2004 NAFA/IAQA Annual Meeting

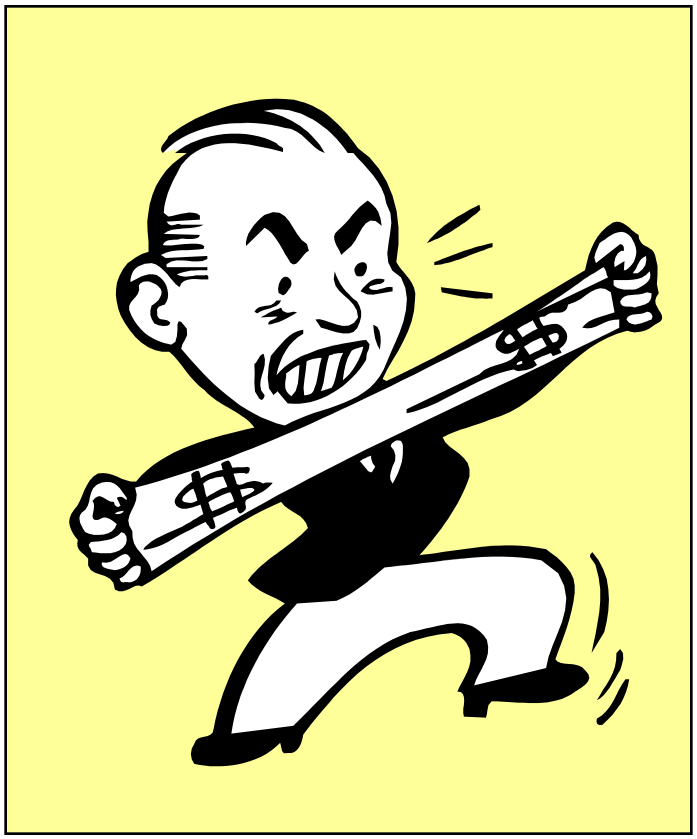
LIFE-CYCLE COSTING:
Version 3
The Value of Energy Savings

David Matela, CAFS
Market Manager
Kimberly-Clark Filtration Products

September 25, 2004 Las Vegas, NV

Creating Partnerships, Building Bridges

Life Cycle Costing



Focused on Price

Creating Partnerships, Building Bridges

Life Cycle Costing

Focused on Life Cycle Cost

Creating Partnerships, Building Bridges

Life Cycle Costing – Version 1

2003 NAFA Technical Conference
Raleigh, NC

- Overview of LCC
- Components of LCC
- Detailed review of energy cost calculations
- Case Study – 4 Story Office Building

Life Cycle Costing – Version 2

Creating Partnerships, Building Bridges

2004 NAFA Technical Conference
Phoenix, AZ

- Focus on energy as the major contributor of life cycle costs
- Selling value vs selling price
- Case Study – The Gallon Jar of Pickles
- Review of energy cost calculation model

Creating Partnerships, Building Bridges

Life Cycle Costing – Version 3

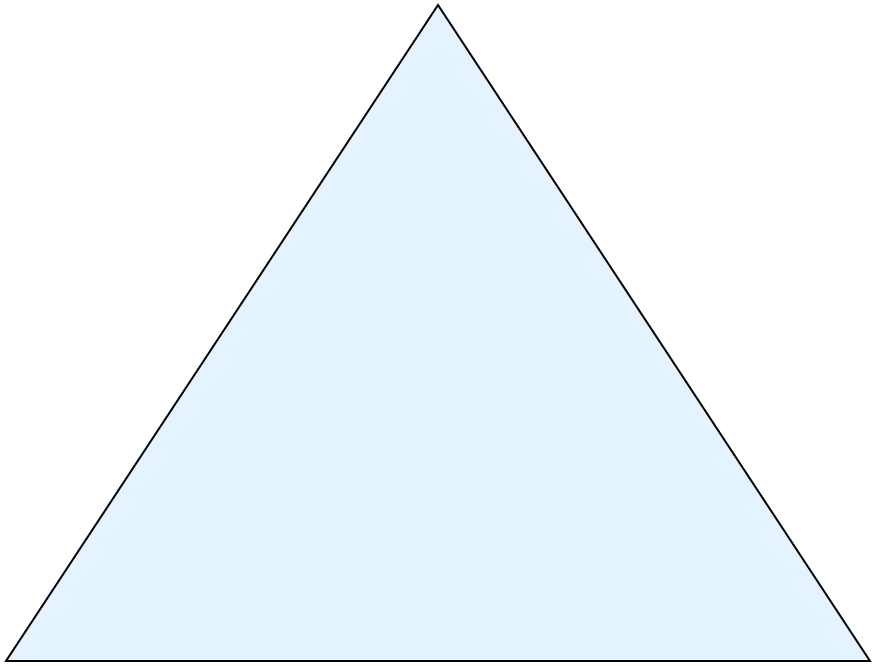
2004 NAFA Annual Conference
Las Vegas, NV

- Changing the paradigm – cost vs price
- Case Study – Misapplication of Life Cycle Costing
- Macroscale impact of filters on energy consumption

Changing the Paradigm

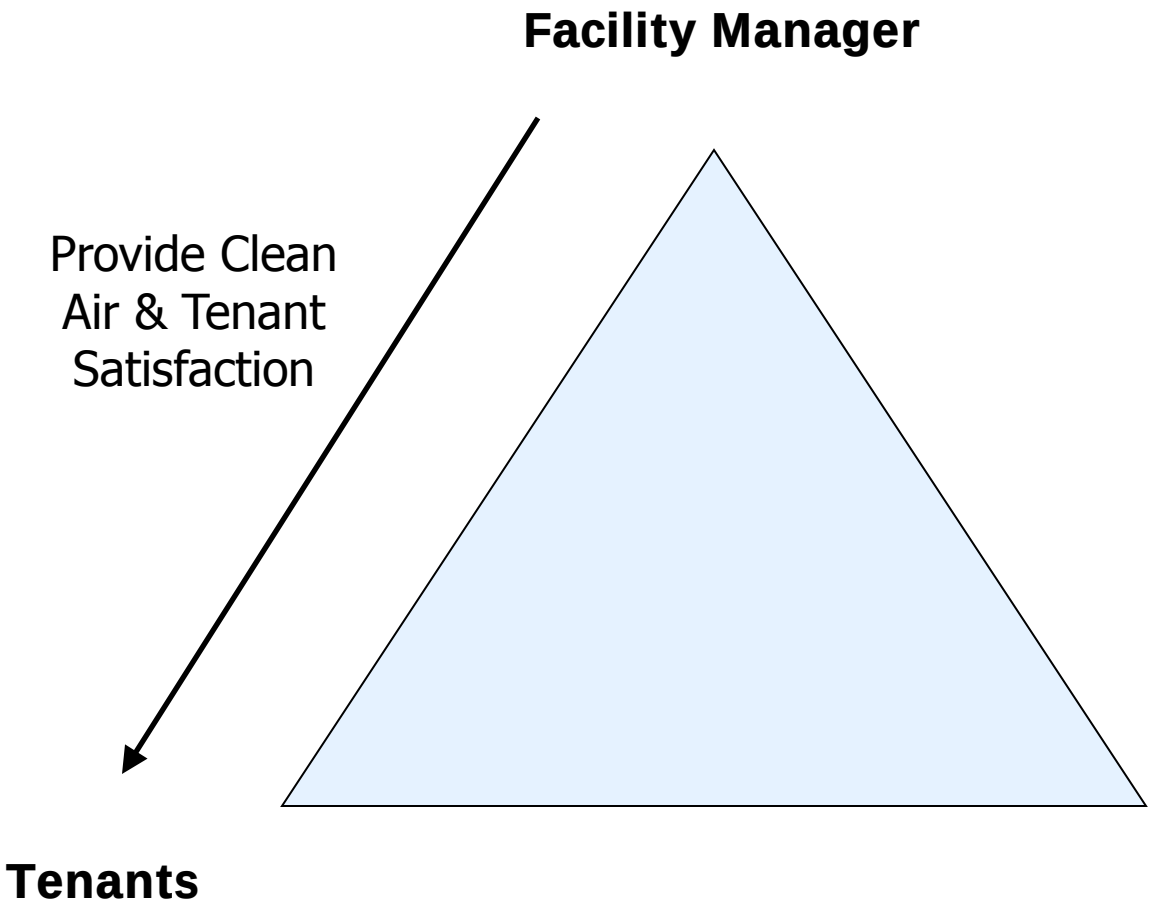
Facility Managers have two accountabilities

Facility Manager



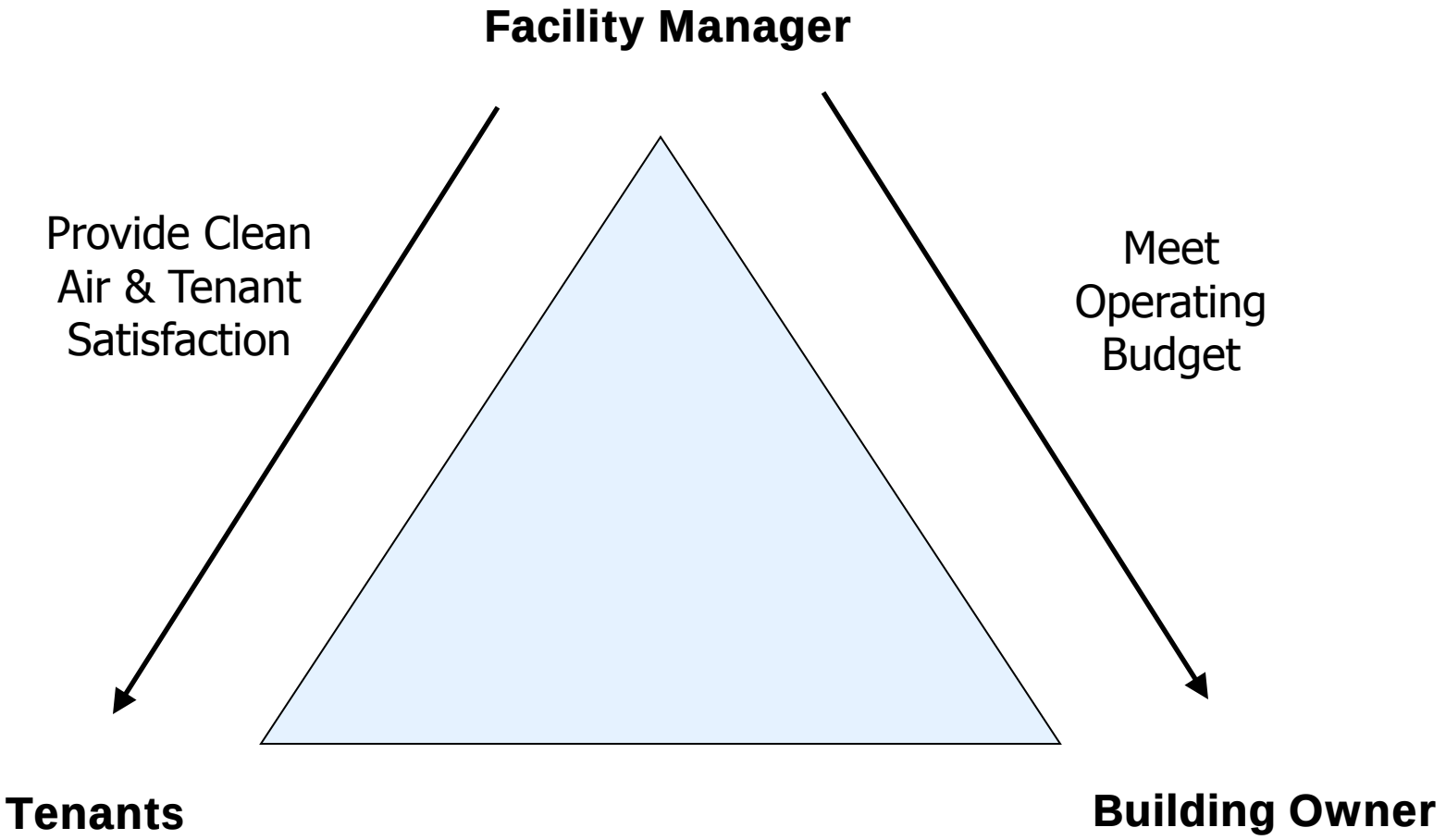
Changing the Paradigm

Facility Managers have two accountabilities



Changing the Paradigm

Facility Managers have two accountabilities



Creating Partnerships, Building Bridges

Changing the Paradigm

Unfortunately, many facility managers are handcuffed by their budget

In cost saving environments, their focus is often on reducing purchase prices rather than on reducing total costs

Creating Partnerships, Building Bridges

Changing the Paradigm

Smart facility owners will want facility managers to focus on the greatest areas of cost savings

The greatest opportunity in HVAC systems does not lie in negotiating the lowest price, but in achieving the lowest energy costs

Creating Partnerships, Building Bridges

Life Cycle Cost Components

Cost = Price + Energy + Maintenance, etc

Life Cycle Cost Components

Cost = Price + Energy + Maintenance, etc

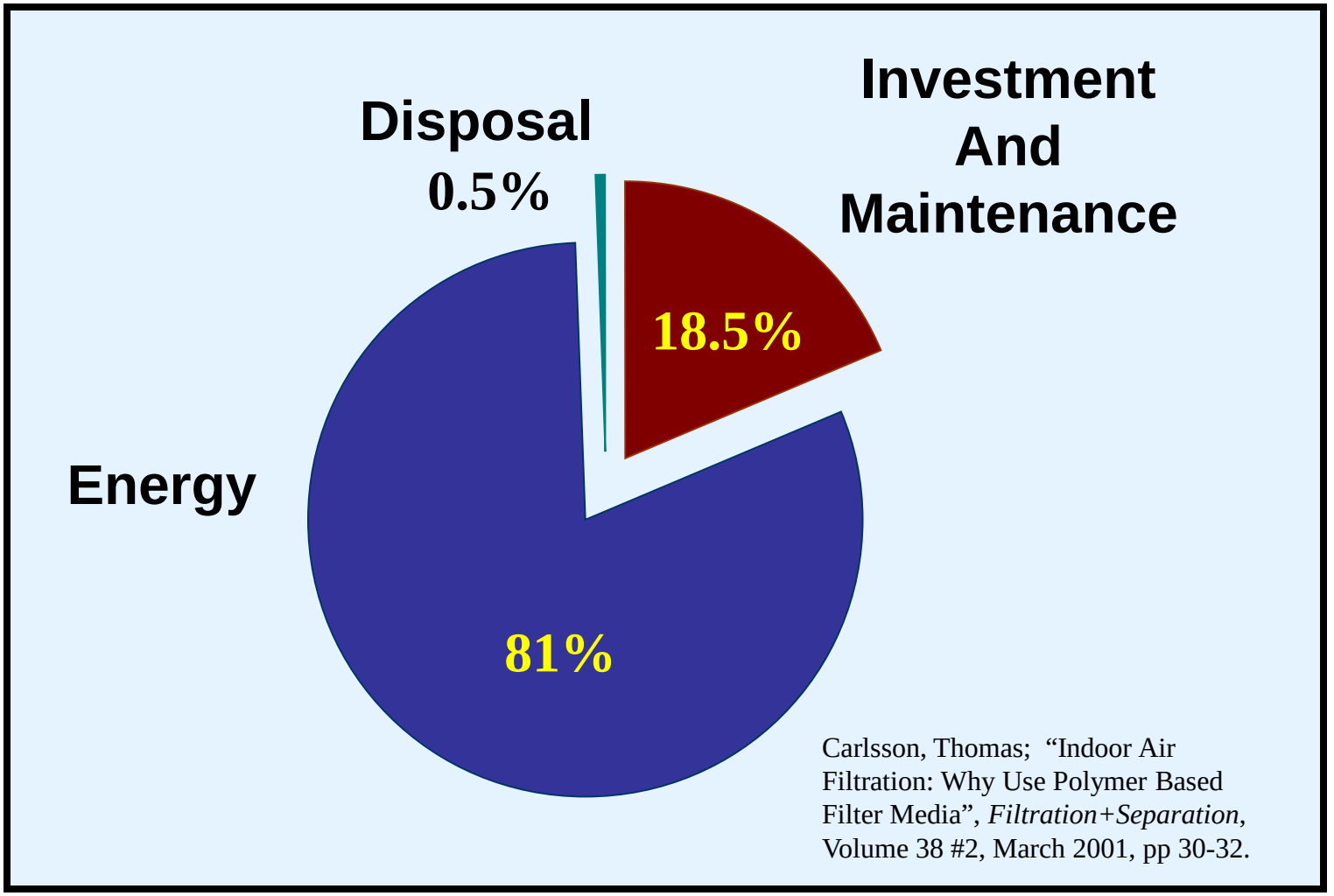
Why do we focus on price?

- It's easy
- It's expected
- It's accepted
- But is it in our best interest?

Price is always a component of a bigger cost picture

Creating Partnerships, Building Bridges

Life-Cycle Cost Components



Carlsson, Thomas; "Indoor Air Filtration: Why Use Polymer Based Filter Media", *Filtration+Separation*, Volume 38 #2, March 2001, pp 30-32.

Creating Partnerships, Building Bridges

Life Cycle Cost Components

Real Life Initial Price / Energy Cost Comparisons

	Initial Price			
Pleated Filter	$4			
Bag Filter	$35			
Box Filter	$70			

All energy cost calculations assume: 24/7/365 operation, $0.08/kWh energy cost, avg dP is straight line average between initial dP and final dP, fan, motor, and drive efficiency total 58%, system airflow is 2000cfm/filter

Creating Partnerships, Building Bridges

Life Cycle Cost Components

Real Life Initial Price / Energy Cost Comparisons

	Initial Price	Energy Cost		
Pleated Filter	$4	$34		
Bag Filter	$35	$196		
Box Filter	$70	$229		

All energy cost calculations assume: 24/7/365 operation, $0.08/kWh energy cost, avg dP is straight line average between initial dP and final dP, fan, motor, and drive efficiency total 58%, system airflow is 2000cfm/filter

Life Cycle Cost Components

Real Life Initial Price / Energy Cost Comparisons

	Initial Price	Energy Cost	Initial Cost %	
Pleated Filter	$4	$34	11%	
Bag Filter	$35	$196	15%	
Box Filter	$70	$229	23%	

All energy cost calculations assume: 24/7/365 operation, $0.08/kWh energy cost, avg dP is straight line average between initial dP and final dP, fan, motor, and drive efficiency total 58%, system airflow is 2000cfm/filter

Creating Partnerships, Building Bridges

Life Cycle Cost Components

Real Life Initial Price / Energy Cost Comparisons

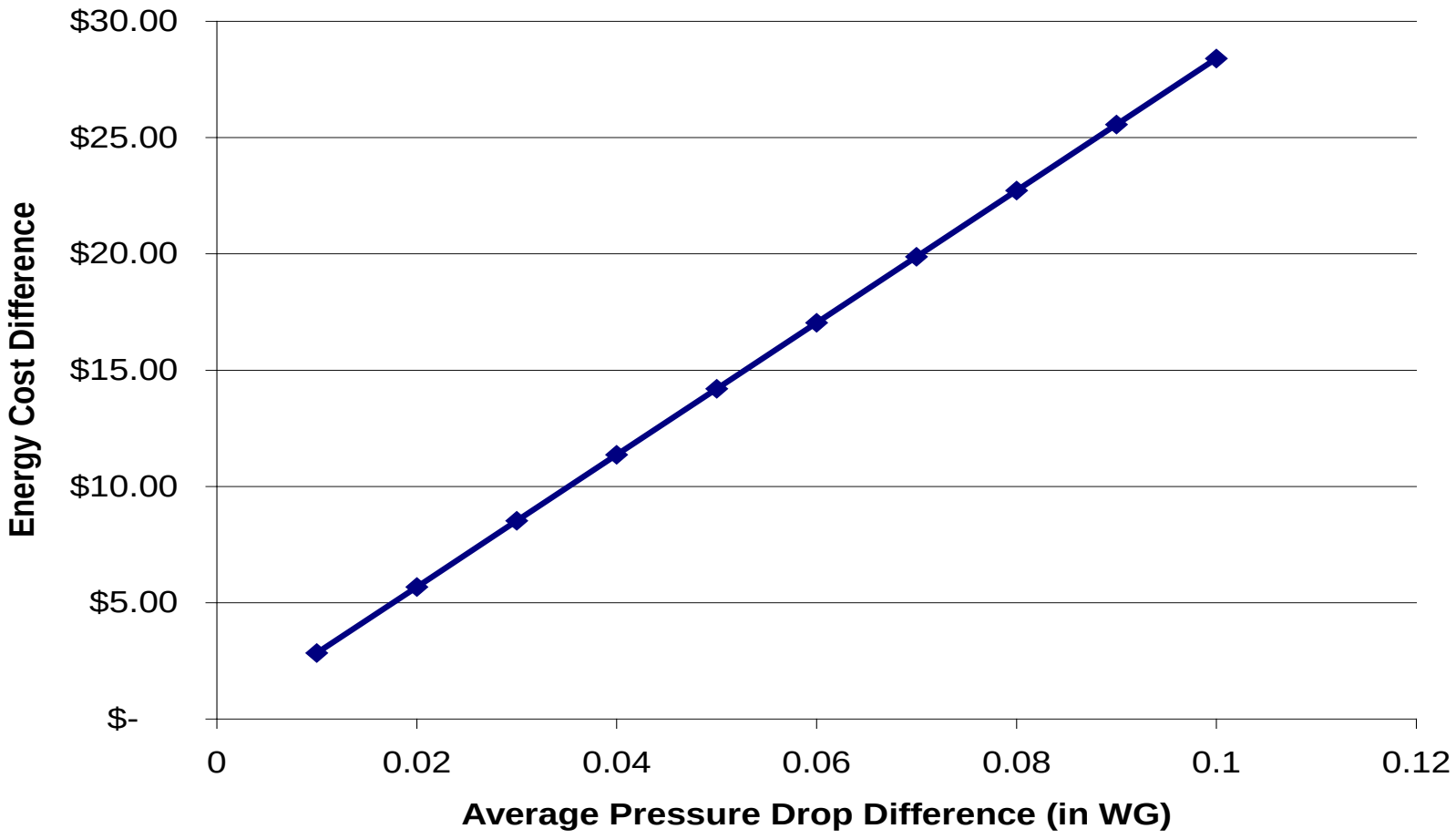
	Initial Price	Energy Cost	Initial Cost %	Energy Cost %
Pleated Filter	$4	$34	11%	**89%**
Bag Filter	$35	$196	15%	**85%**
Box Filter	$70	$229	23%	**77%**

All energy cost calculations assume: 24/7/365 operation, $0.08/kWh energy cost, avg dP is straight line average between initial dP and final dP, fan, motor, and drive efficiency total 58%, system airflow is 2000cfm/filter

Creating Partnerships, Building Bridges

Life Cycle Cost Components

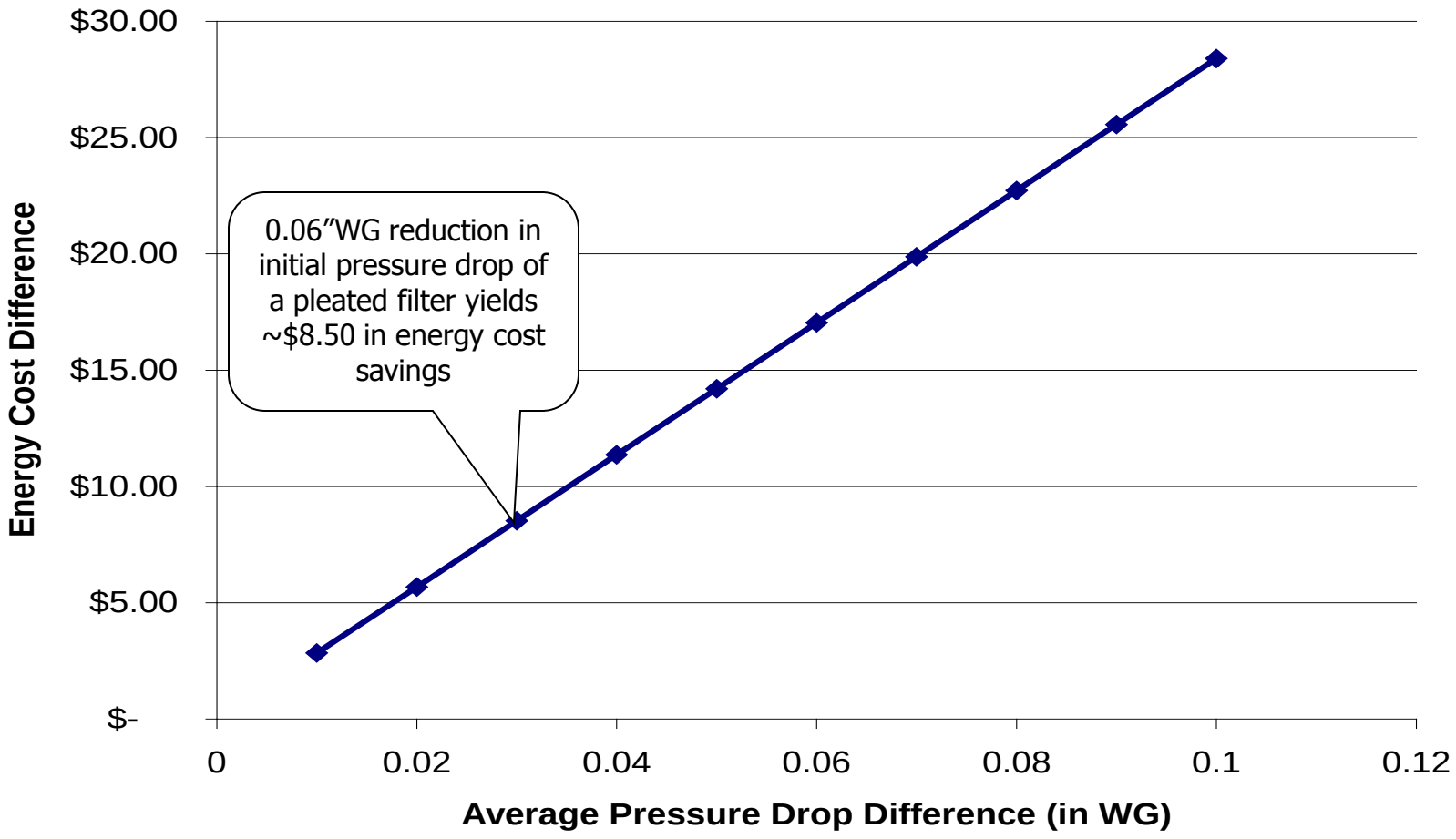
How much savings is realistic?



Creating Partnerships, Building Bridges

Life Cycle Cost Components

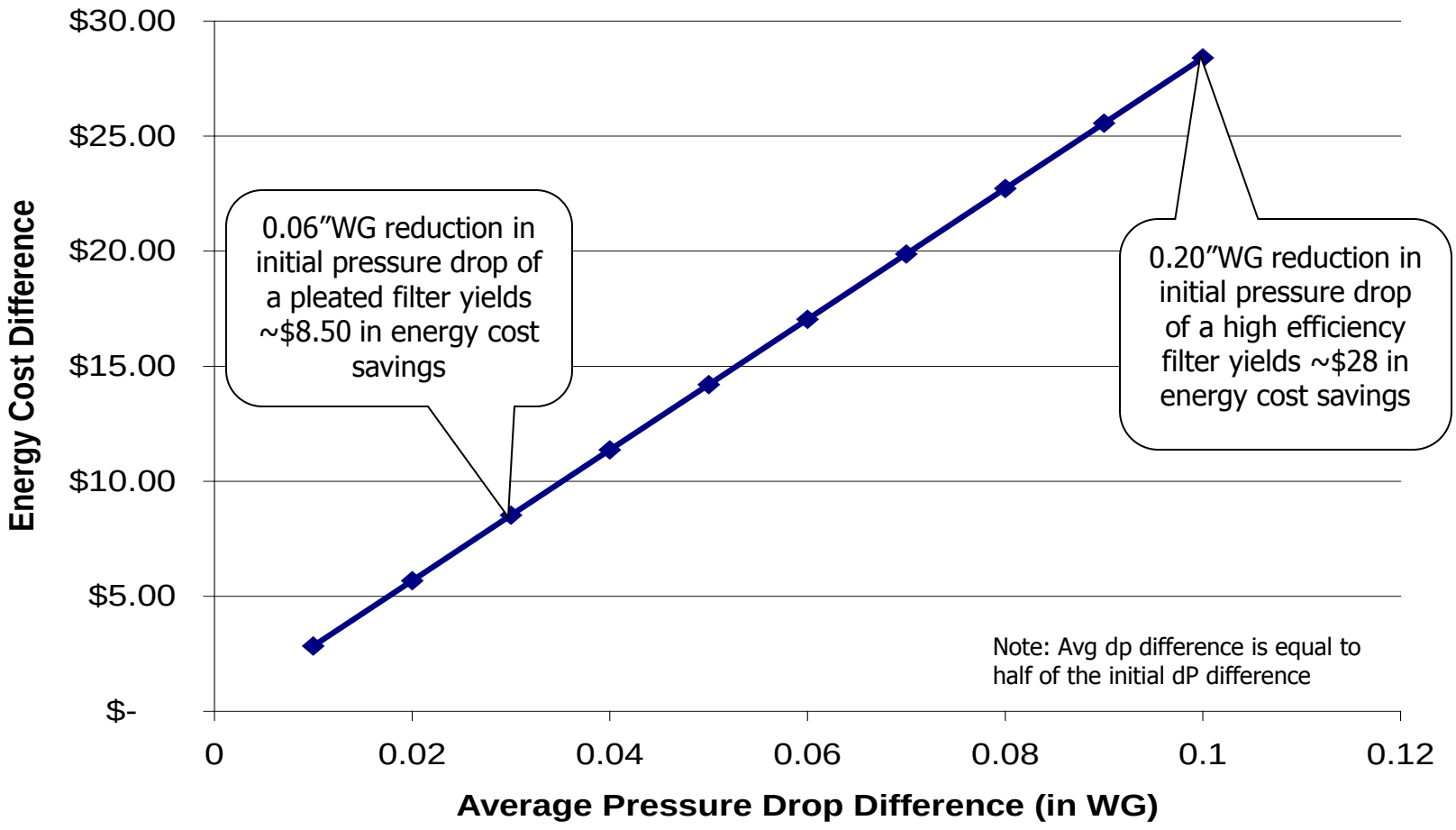
How much savings is realistic?



Creating Partnerships, Building Bridges

Life Cycle Cost Components

How much savings is realistic?

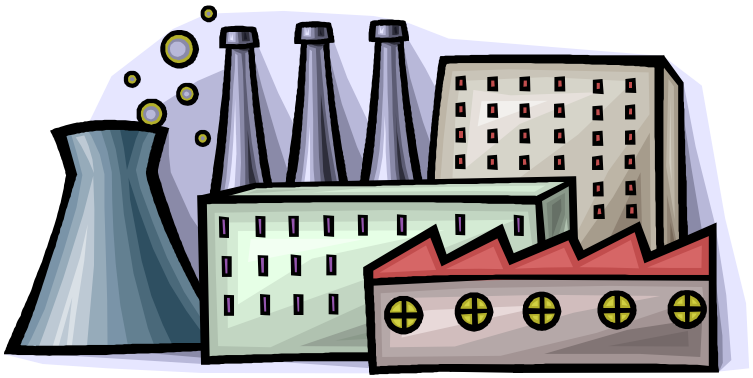


Creating Partnerships, Building Bridges

Case Study

Industrial Facility

- 8 AHU's à 220 total filters
- 150 filters changed monthly
- 24/7/365 operation
- Current filter system vs new filter system



Case Study

	Current System	New System
Price	$45	$34
Annual Filter Cost	$81,000	$61,200

Creating Partnerships, Building Bridges

Case Study

	Current System	New System
Price	$45	$34
Annual Filter Cost	$81,000	$61,200
Initial ΔP	0.75"WG	0.50"WG
Annual Energy Cost	$64,200	$46,900

Creating Partnerships, Building Bridges

Case Study

Customer Results		
Price Savings:	$19,800/yr	24%
Energy Savings:	$17,300/yr	27%
Total Savings:	$37,100/yr	26%

Creating Partnerships, Building Bridges

Case Study

Distributor Results

Sales Impact:	-$19,800/yr	-24%

Creating Partnerships, Building Bridges

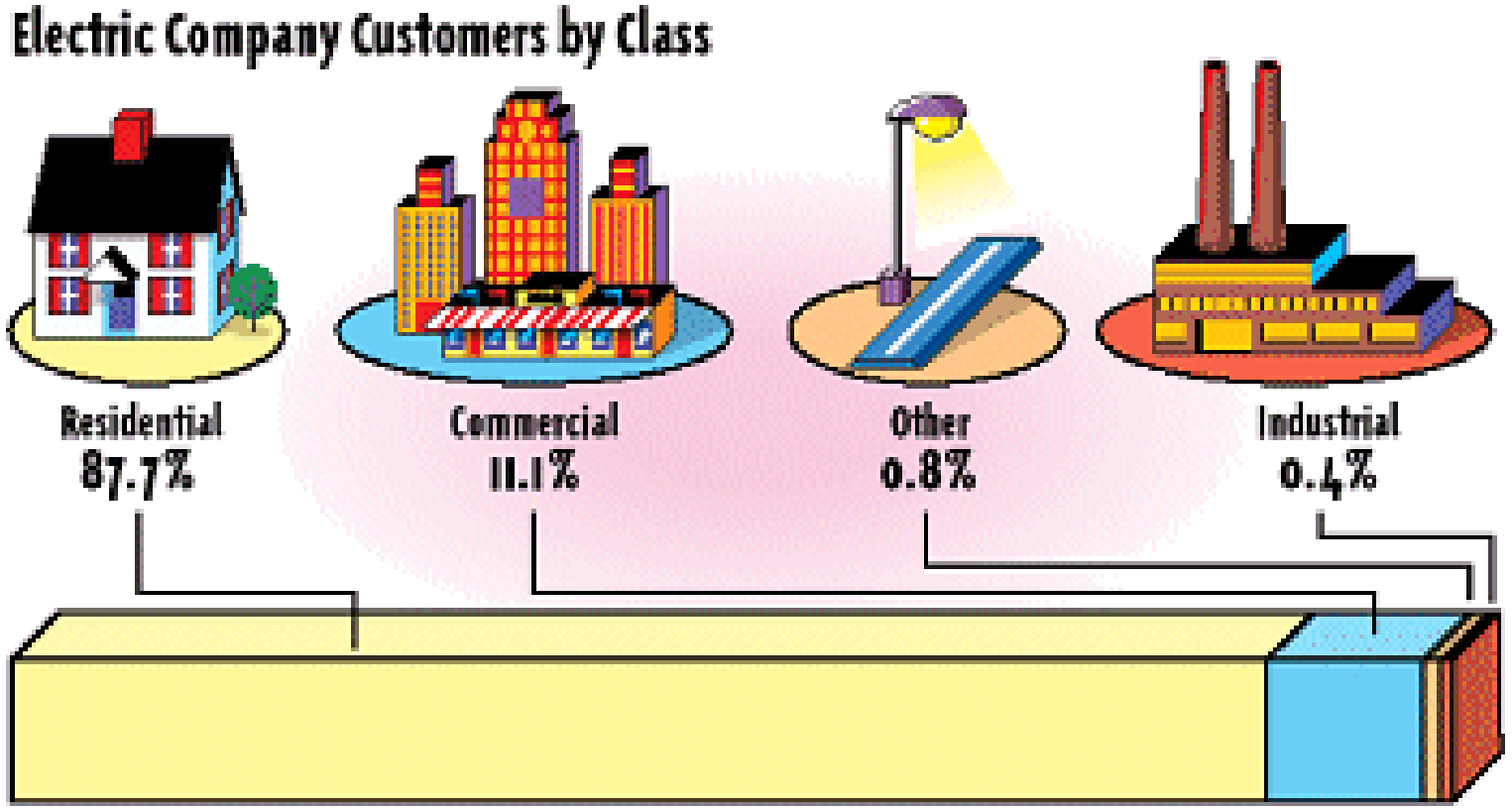
Case Study

Proper application of life cycle costing allows sellers to add value to end users *and* protect sales and margins

Cost Savings should come from someone else's pocket!

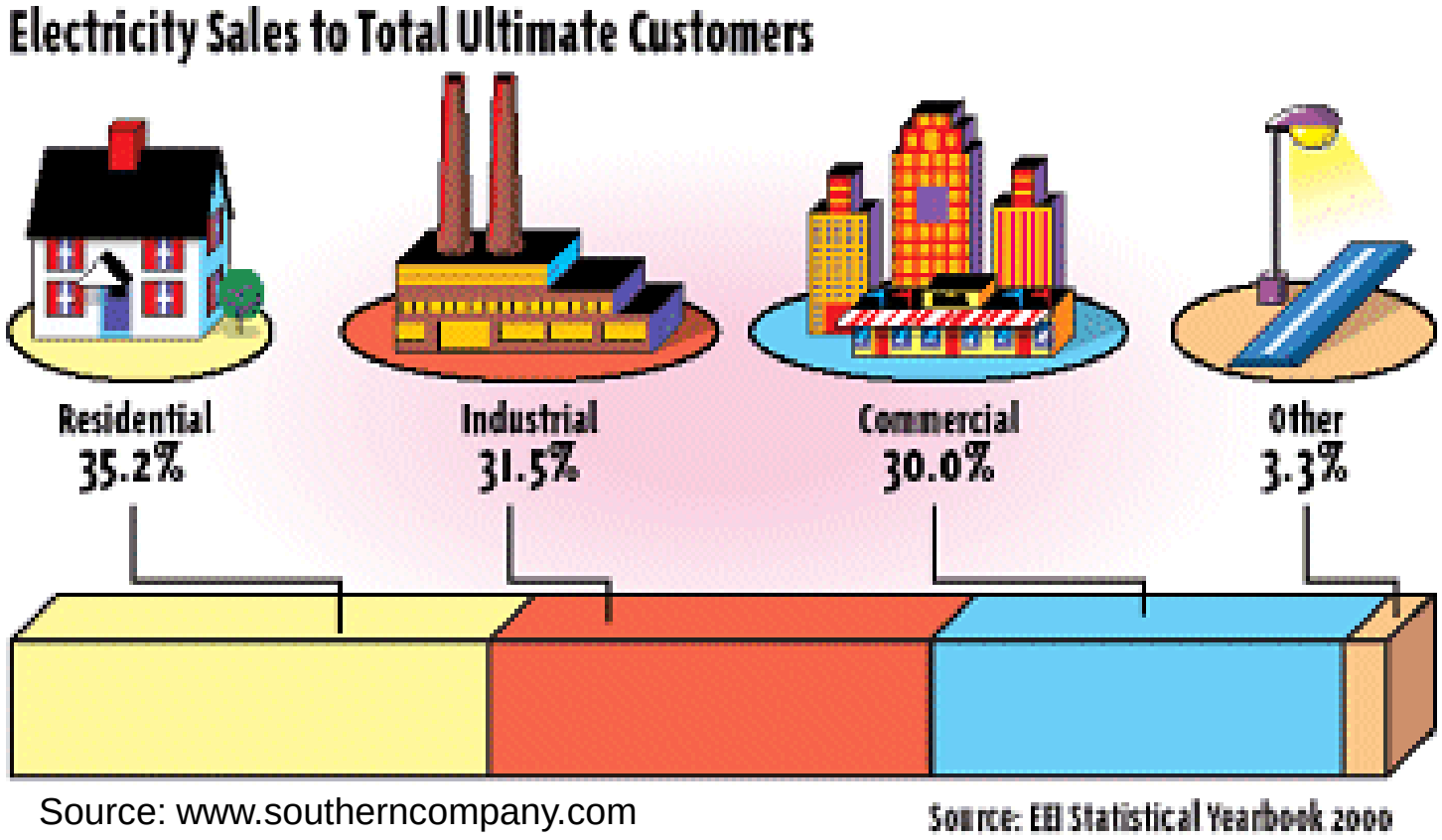
Life Cycle Costing should be factored into your overall selling strategy. Consider: profits, sales, product life, service, performance upselling, etc.

Macroscale Perspective



Source: www.southerncompany.com

Macroscale Perspective



Source: www.southerncompany.com

Macroscale Perspective

- Commercial Buildings – Electricity Usage
  - Heating and Cooling 40%
  - Lighting 31%
  - Other 22%
  - Water Heating 7%

Source: EEI “Commercial and Industrial Energy Saving Tips”

Macroscale Perspective

2003 Electricity Sales	$216 billion
Commercial Sector Electricity Share	x 30%
Commercial Sector Consumption	$65 billion

Creating Partnerships, Building Bridges

Macroscale Perspective

2003 Electricity Sales	$216 billion
Commercial Sector Electricity Share	x 30%
Commercial Sector Consumption	$65 billion

Commercial Sector Consumption	$65 billion
HVAC Electricity Share	x 40%
Commercial Sector HVAC Consumption	$26 billion

Creating Partnerships, Building Bridges

Macroscale Perspective

Commercial Sector HVAC Consumption	$26 billion
Price ($/kWh)	/ $0.08
Commercial HVAC Usage (kWh)	325 billion

Commercial Building HVAC usage accounts for 12% of the total electricity consumed in the US

Creating Partnerships, Building Bridges

Macroscale Perspective

Assume that the Average Pressure Drop is reduced by 0.025”WG on all commercial HVAC filters

$$\frac{\text{0.700” WG}}{\text{0.675” WG}} = \frac{\text{325 billion kWh}}{\text{X}}$$

X = 313 billion kWh

Macroscale Perspective

That equates to a savings of:

- 12 billion kWh

Macroscale Perspective

That equates to a savings of:

- 12 billion kWh
- $993 million

Creating Partnerships, Building Bridges

Macroscale Perspective

That equates to a savings of:

- 12 billion kWh
- $993 million
- 3.6% of the energy associated with operating commercial HVAC systems

Is this significant?

Creating Partnerships, Building Bridges

Macroscale Perspective

Consider this…

- The US Commercial/Industrial HVAC filter market is estimated to be $2 billion
- The savings available through the use of low pressure drop filters approach $1 billion
- Filter prices would have to drop by *~50%* to approach the level of cost savings available through energy conservation

Where to Go From Here?

- Educate yourself on the impact of pressure drop in relation to energy costs

Creating Partnerships, Building Bridges

Where to Go From Here?

- Educate yourself on the impact of pressure drop in relation to energy costs
- Educate your customers on the importance of considering total costs and not simply initial price – Show them the money!

Creating Partnerships, Building Bridges

Creating Partnerships, Building Bridges

Where to Go From Here?

- Educate yourself on the impact of pressure drop in relation to energy costs
- Educate your customers on the importance of considering total costs and not simply initial price – Show them the money!
- Find the right decision maker, there may be more than one

Creating Partnerships, Building Bridges

Where to Go From Here?

- Educate yourself on the impact of pressure drop in relation to energy costs
- Educate your customers on the importance of considering total costs and not simply initial price – Show them the money!
- Find the right decision maker, there may be more than one
- Understand the role of energy conservation in attaining LEED, Energy Star, and other building certifications – align your sales strategy with the goals of the building

Creating Partnerships, Building Bridges

Thank You!

Questions?