



Reducing Energy Consumption

Improving the Triple Bottom Line

Al Neuner, CHFM Associate Vice President

Facility Operations

Geisinger Health System

GEISINGER
HEALTH SYSTEM

Definition: “Triple Bottom Line”

- A business principle that measures corporate performance along three lines: profits, environmental sustainability, and social responsibility.
- Commonly referred to as :
 - People
 - Planet
 - Profit



Sample Healthcare Mission Statements

- “First, do no harm”
- “Improve the health of the patients and communities we serve”
- “provide quality health services and facilities for the community, to promote wellness”
- “To participate in the creation of healthier lives within the community”
- “to improve the health of the people and communities we serve and to manage illness with skill and compassion”

2003 US Energy Information Administration Survey

- Buildings are responsible for almost half the energy consumption in the US and 48% of greenhouse gases
- Inpatient healthcare facilities use approximately **twice** the energy as office buildings of the same size, **second** only to food service in energy intensity
- Clearly, healthcare's intensive use of energy contributes disproportionately to the public health consequences of human-induced climate change.

Baseline Energy Use Impact

GMC - Alan Neuner - (570) 271-5515

3: MAAC



Select from Map

Mid-Atlantic Area Council

kWh per Year:

Calculate

Clean Energy Fraction: %

Pollutants	Annual Quantity	Pollutant Permit Costs
SO2 (Tons):	217.89	\$119,405 per year
NOx (Tons):	46.25	\$136,447 per year
CO2 (Tons):	29,955.54	\$958,577 EU Pricing
Mercury (Tons):	2.52	\$163,847 per year

Incidents	Per Year	Societal Value	Direct Medical Costs
Premature Death:	0.67	\$4,545,612	\$193,295
Chronic Bronchitis:	0.43	\$200,743	\$49,698
Hospital Visit Incidents:	0.61	\$7,748	\$6,122
Asthma Attacks:	13.83	\$799	\$759
Respiratory Symptoms:	660.04	\$22,979	\$22,979
Work Loss Days:	121.74	\$21,271	\$19,725
Mercury Related:	N/A	\$337,524	\$337,524
Totals:	N/A	\$5,136,677	\$630,102
Unintended Impacts/kWh:		0.09162	0.01124

Post Energy Saving Strategy

GMC - Alan Neuner - (570) 271-5515

3: MAAC

Select from Map

Mid-Atlantic Area Council

kWh per Year:

49,056,000

Calculate

Clean Energy Fraction:

1 %

Pollutants	Annual Quantity	Pollutant Permit Costs	
SO2 (Tons):	190.66	\$104,480	per year
NOx (Tons):	40.47	\$119,392	per year
CO2 (Tons):	26,211.09	\$838,755	EU Pricing
Mercury (Tons):	2.21	\$143,366	per year

Incidents	Per Year	Societal Value	Direct Medical Costs
Premature Death:	0.59	\$3,977,412	\$169,134
Chronic Bronchitis:	0.38	\$175,652	\$43,487
Hospital Visit Incidents:	0.53	\$6,779	\$5,356
Asthma Attacks:	12.10	\$698	\$664
Respiratory Symptoms:	577.53	\$20,106	\$20,106
Work Loss Days:	106.53	\$18,613	\$17,260
Mercury Related:	N/A	\$295,334	\$295,334
Totals:	N/A	\$4,494,594	\$551,341
Unintended Impacts/kWh:		0.09162	0.01124

Net Effect of Energy Reduction

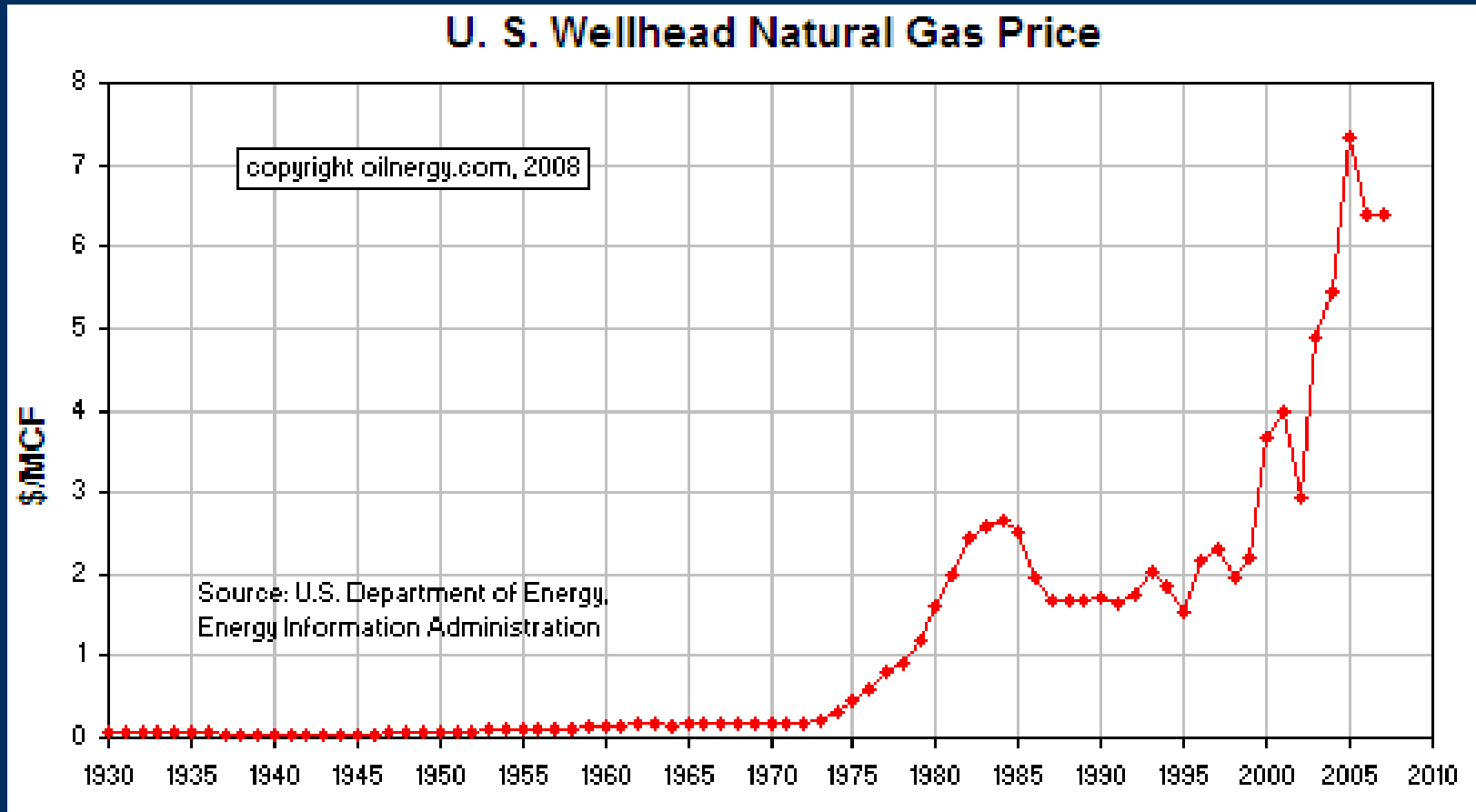
	<u>Pre</u>	<u>Post</u>	<u>Savings</u>
Electricity (kWh)	56,064,000	49,056,000	7,008,000
Cost (\$.06/kWh)	\$3,363,840	\$2,943,360	\$420,480
Pollutants Generated			
<i>SO2</i>	217.89	190.66	27.23
<i>Nox</i>	46.25	40.47	5.78
<i>CO2</i>	29955.54	26211.09	3,744.45
<i>Mercury</i>	2.52	2.21	0.31
Heath Incidents per Million			
<i>Premature Death</i>	0.67	0.59	0.08
<i>Chronic Bronchitis</i>	0.43	0.38	0.05
<i>Hospital Visits</i>	0.61	0.53	0.08
<i>Asthma attacks</i>	13.83	12.1	1.73
<i>Respiratory Symptoms</i>	660.04	577.73	82.31
<i>Work Loss Days</i>	121.74	106.53	15.21
Societal Value	\$5,136,677	\$4,494,594	\$642,083
Direct Medical Costs	\$630,102	\$551,341	\$78,761

Pollution Equivalents From Previous Example

- 288,000 trees (411 acres)
- 658 cars
- 496 homes



Energy Price Trends



Available Strategies

- Buy better (cheaper)
 - Generally provides only one time significant savings
 - No improvement to “People/Planet” unless “Green Energy” is included in supply
- Use Less
 - Decreases exposure to price escalations -permanently
 - Reduces pollution
 - Improves health
 - ROI generally better than many clinical investments
 - Low financial risk
- For maximum benefit – **Do Both!**

Investment Strategies

- Most healthcare endeavors yield a +/- 5% operating margin
- Investments yield -20% to +20% return (high risk)
- Most energy projects yield a one to five year payback, which translates to a yield of 20% to 100% with little or no risk!

Review of Facts

- Healthcare is a large consumer of energy
- Energy generation and the resultant pollution produced adversely impacts health
- Part of healthcare's mission is to improve health
- Energy prices will continue to increase over time as world consumption increases for finite resources
- Reducing energy use reduces cost

Conclusions

- Investment in energy projects are lower risk and higher returns than most investments
- Increasing energy costs over time improve the operating return of energy improvement initiatives
- Reducing energy consumption and the resultant pollution is a part of healthcare's mission to improve health

Financing Options

- Reserves
- Capital (depreciation)
- Lease (Capital or operating)
- Performance Contract
- Outsource (sale of assets with buy back)

Where to Start?

- Benchmark usage – EnergyStar
- Engage Facilities Director/VP
- Start a Green Team
- Build LEED buildings
- Hire a consultant
- Develop Infrastructure Master Plan
- Establish annual funding for improvements

Experience at Geisinger

Electrical demand (kW) has not increased since 1990. During that time the following changes have occurred:

- Campus expanded from 1.2 to 2.1 million square feet
- Cooling converted from steam to electric
- 8000 personal computers added

This equates to a 43% reduction in electrical usage resulting in annual savings of approximately \$3,000,000, which is used to fund infrastructure renewal. Natural gas experience is similar with annual savings of over \$1,000,000 annually.

Saving More Than You Know

When you invest in energy efficiency, the benefits go far beyond saving energy and money, and protecting the environment by helping prevent pollution and greenhouse gas emissions.

- *Enhanced Employee Productivity: Enhanced comfort and improved lighting conditions may contribute to improvements in staff productivity.*
- *Reduced Operations and Maintenance Costs: Many energy-efficient technologies significantly decrease your operations and maintenance requirements, saving not only money but also staff time.*
- *Increased Customer Comfort: Building upgrades will improve your facility's appearance, present your products or services in a comfortable, well-lit environment, and help your customers enjoy their visit. This can increase sales and encourage repeat business.*
- *Increased Asset Value: Efficient business properties have higher market values than those with higher operating costs.*
- *Enhanced Public Image: Your contribution to environmental protection very positively differentiates your business from your competitors.*

Questions?

- Contact:

Al Neuner

aka: the Facilities Guy

Geisinger Health System

Phone: (570)271-5515

E-mail: aneuner@geisinger.edu