



# Chicago Green Healthcare Initiative (CGHI)

Facility Manager Peer Exchange  
January 18, 2013



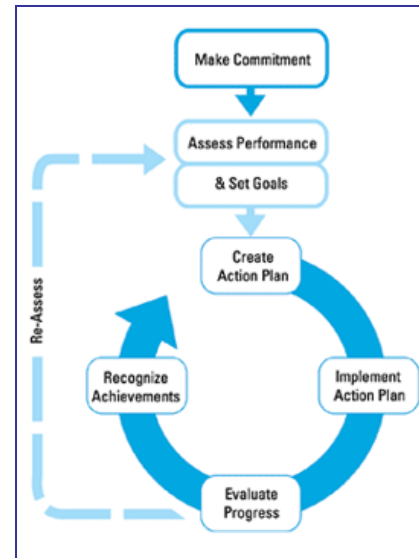
# Agenda



- 2012 Hospital Successes 10 min
- 2013 Objectives 15 min
- Calculating Return On Investment 20 min
- Performing Life Cycle Cost Analysis 30 min
- The Joint Commission Time Permitting
- Peoples Gas Rebates Update 10 min
- Announcements 5 min

# 2012 Hospital Successes

1. Make Commitment
2. Assess Performance
3. Set Goals
4. Create Action Plan
5. Implement Action Plan
6. Evaluate Progress
7. Recognize Achievements



Hospital successes loosely categorized within the US EPA's Energy Star Guidelines for Energy Management framework.

1. Make Commitment
  - 7 hospitals signed CGHI Pledge (total 22)
  - 6 Facility Manger Peer Exchange meetings attended
  - Collaboration among hospitals taking place



# 2012 Hospital Successes

## 2. Assess Performance

- 15 Portfolio Manager accounts managed/configured; 4 in progress
- 9 ComEd Facility/System Assessments conducted and/or underway
- 1 district energy system metered
- 1 retro-commissioning project underway
- 1 waste audit conducted
- 10 steam trap audits conducted

Attribute	Value
~# of Square Feet	8,136,536
~Market Value of Audits	TBD
~# of Steam Traps Evaluated	3,055
~Replacement Cost of all Steam Traps	\$2,833,254
~Cost Savings / Year	\$1,122,973
~Energy Savings MMTBU/Year	16,380
~MtCO <sub>2</sub> e Savings	871
~Simple Payback in Years	2.5



# 2012 Hospital Successes

## 3. Set Goals

- 1 energy reduction goal set (total 2)

## 4. Create Action Plan

- *See Implement Action Plan*

## 5. Implement Action Plan

- 100s of T12 to T8 Lighting and Exit Sign retrofits
- Induction lighting retrofit in parking garage
- LED retrofit of hospital marquee sign
- 10 chillers being replaced
- 10 burners in boilers being replaced
- 2 Inteli-Hood kitchen demand ventilation control retrofits
- Installation of condensate capture and reuse system
- Numerous steam traps replaced
- Installation of system to discharge captured roof rain into Lake Michigan
- Numerous Peoples Gas double rebates taken advantage of



# 2012 Hospital Successes

## 6. Evaluate Progress

- Energy savings from baselines that range from 2008 to 2011

~kWh Savings	~Therm Savings	~MMBTU Savings	~MtCO <sub>2</sub> e Savings	~Sector MMBTUs	~% Reduction
23,580,224	2,330,644	268,031	26,800	6,565,144	4%

The above GHG savings is equivalent to each of the following:

- The annual emissions from 5,255 passenger vehicles in one year
- The annual emissions from the energy use of 2,320 homes
- The carbon sequestered from 687,178 urban trees

## 7. Recognize Achievements

- Within Hospital?
- To broader community (2013 Objective)



## 2013 Objectives



## 2013 Objectives – Continuation from 2012

1. Recognize Achievements
  - Highlight Chicago Healthcare sector as national leader
  - More complete picture of sector's progress
2. Peer Exchanges / Collaboration
  - Topics for the year?
  - Guest speakers?
3. EEPS Contributions / Utility Rebates
  - Promote changes and support application
  - Fully recoup contributions?
4. Identify Funding/Financing Opportunities
  - National and Local Community Foundation Support
5. Portfolio Manager Aggregation
  - Contributes to Recognizing Achievements
  - Set target date for complete configuration?
6. Engage Additional Hospitals
  - Hospital outreach?





## 2013 Objectives – Potential New Objectives

- Executive level steering committee
  - Raise the awareness and buy-in within hospitals
- Sub-groups
- Energy disclosure ordinance
  - Support?
  - Get out in front of?
- Set energy reduction goal
  - Contributes to Recognizing Achievements
- Utility rebates for other measures
  - Ultra Low Temperature Freezers
  - Demand vent that senses air qnty
- Energy Purchasing Aggregation
  - Increase renewable energy percentage
- Potential Funding Support
  - Meter requirement study
  - Strategic Energy Management Plans
  - Benchmark Water Use
- Others?



## Calculating Return On Investment

Elevate Energy Management to Senior Managers



# Calculating Return on Investments

- Simple Payback
- Net Present Value (NPV)
- Internal Rate of Return (IRR)
- Return on Investment (ROI)
- Cost of Delay
- Net Patient Revenue Equivalent
- Sustainable Return on Investment (SROI)



# Simple Payback

- Determines time for project to pay for itself
- Calculation:  $\text{Project Cost} \div \text{Annual Cost Savings}$

<b>Simple Payback</b>	<b>Project Cost</b>	<b>Annual Savings</b>	<b>Simple Payback</b>
Scenario 1	\$100,000	\$20,000	5.0
Scenario 2	\$200,000	\$35,000	5.7



# Net Present Value

- Values projects based on scale and timing of cash flows

Net Present Value			Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Scenario 1	\$77,480	Cost	-\$100,000									
		Savings	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000
		Net Cash Flc	-\$80,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000
Scenario 2	\$111,200	Project Cost	-\$200,000									
		Savings	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000
		Net Cash Flc	-\$165,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000

Discount Rate: Cost of Capital + Adjustment for the level of risk. Example uses 2.5%



# Net Present Value

## Harvard University Sample Calculations

### Internal Energy Auditing to Meet Portfolio-wide GHG Reduction Goals Exercise Results 10.11.2010

#### Andover Hall ECM Results:

ECM	Cost	Savings	Rebate	NPV	GHG Reduction
Demand control ventilation	\$15,000	\$17,000	\$0	\$248,000	53 MTCDE
DX economizer control	\$1,500	\$2,417	\$0	\$38,500	7 MTCDE
Halogen light replacement	\$2,000	\$458	\$0	\$4,000	1 MTCDE
Update HHW pumps	\$1,500	\$238	\$0	\$2,800	1 MTCDE

#### Engineering Science Lab ECM Results:

ECM	Cost	Savings	Rebate	NPV	GHG Reduction
Toilet exhaust fan reschedule	\$1,000	\$7,500	\$0	\$146,000	29 MTCDE
Vary fume hood air volume	\$105,000	\$30,000	\$0	\$443,500	97 MTCDE
Heat transfer loop repair	\$8,000	\$38,000	\$0	\$537,000	99 MTCDE
Compressor VFD	\$20,000	\$16,000	\$0	\$200,000	36 MTCDE

# Internal Rate of Return (IRR)

- Indicator of the efficiency, quality, or yield of an investment
- IRR = rate that makes the NPV of all cash flows equal to zero

Scenario	IRR
1	20.2%
2	15.3%

Net Present Value			Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Scenario 1	\$77,480	Cost	-\$100,000									
		Savings	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000
		Net Cash Flow	-\$80,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000
Scenario 2	\$111,200	Project Cost	-\$200,000									
		Savings	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000
		Net Cash Flow	-\$165,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000	\$35,000



# Return on Investment (ROI)

Return On Investment (ROI)		Year 1	Year 2	Year 3	Year 4	Year 5
Invest in Low Risk Financial Instrument	\$2,500,000					
Interest from Investment		\$50,750	\$50,750	\$50,750	\$50,750	\$50,750
Yearly ROI	2.03%					
Invest in Energy Efficiency	\$2,500,000					
Utility Expense Savings		\$35,000	\$35,000	\$35,000	\$35,000	\$35,000
Maintenance Savings		\$35,000	\$35,000	\$35,000	\$35,000	\$35,000
Net Cash Flow		\$70,000	\$70,000	\$70,000	\$70,000	\$70,000
Yearly ROI	2.80%					





# Cost of Delay

- Quantifies savings forgone from delaying a project
- Factors in:
  - Lost savings from higher efficiency equipment
  - Increased maintenance of old equipment
- Project savings offset debt payments



# Cost of Delay – Conceptual Example

Cost of Delay	-\$94,517	Year 1	Year 2	Year 3	Year 4	Year 5
<b>Install Efficient Equipment in 5 Years</b>						
Utility Expense		-\$35,000	-\$35,000	-\$35,000	-\$35,000	-\$35,000
Maintenance Expense		-\$35,000	-\$35,000	-\$35,000	-\$35,000	-\$35,000
Equipment Expense						-\$2,898,200
<b>Net Cash Flow</b>		-\$70,000	-\$70,000	-\$70,000	-\$70,000	-\$2,968,200
<b>Net Present Value</b>	-\$2,573,879					
<b>Install Efficient Equipment Today</b>						
Utility Expense		\$35,000	\$35,000	\$35,000	\$35,000	\$35,000
Maintenance Expense		\$35,000	\$35,000	\$35,000	\$35,000	\$35,000
Equipment Expense		-\$2,500,000				
Financing Expense		-\$62,500	-\$60,053	-\$57,545	-\$54,975	-\$52,340
<b>Net Cash Flow</b>		-\$2,527,500	-\$25,053	-\$22,545	-\$19,975	-\$17,340
<b>Net Present Value</b>	-\$2,479,362					



# Net Patient Revenue Equivalent

- Calculation: Project Savings / Hospital's Operating Margin Percentage
- \$1 Savings / 2% Hospital Operating Margin = \$50 in NPR Equivalent

Net Patient Revenue	\$4,039,987	Year 1	Year 2	Year 3	Year 4	Year 5
Loan Payment		-\$62,500	-\$60,053	-\$57,545	-\$54,975	-\$52,340
Energy Savings		\$75,000	\$75,000	\$75,000	\$75,000	\$75,000
Net Cash Flow		\$12,500	\$14,947	\$17,455	\$20,025	\$22,660
Net Present Value	\$80,800					

AHA 2009 Trendwatch Report: average hospital operating margin in 2007 was 2.6%

Discount Rate: Cost of Capital + Adjustment for the level of risk. Example uses 2.5%



# What is the Net Patient Revenue Equivalent **LOSS** of your annual EEPS assessments?

- \$50,000 annual EEPS assessment
- 2% operating margin
- \$2,500,000 annual revenue equivalent loss

As Operating Margin gets smaller, Equivalent Revenue Loss gets bigger.

Place your cursor over the text below for instruction.  
Enter the values with Year 1 as your most recent year.

	Year 1	Year 2	Year 3	Year 4	Year 5
Energy Cost Savings:	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
Operating Margin:	2.0%	2.0%	2.0%	2.0%	2.0%

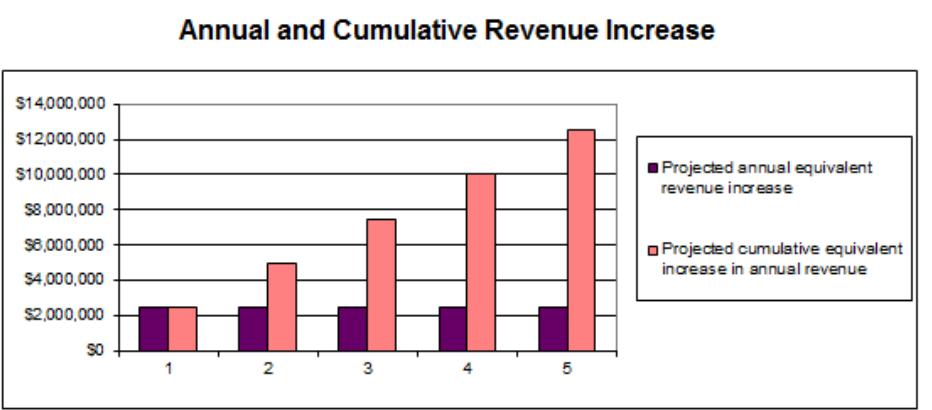
Use Sample Data OR Import Energy Savings

**Outputs**

Every dollar saved in energy is equivalent to generating new revenues of:

	Year 1	Year 2	Year 3	Year 4
Equivalent increase in annual revenue:	\$2,500,000	\$2,500,000	\$2,500,000	\$2,500,000
Total equivalent increase in revenue:	\$12,500,000			

Saving \$250,000 in energy at your hospital is equivalent to generating \$12,500,000 revenues.



Year	Projected annual equivalent revenue increase	Projected cumulative equivalent increase in annual revenue
1	\$2,500,000	\$2,500,000
2	\$2,500,000	\$5,000,000
3	\$2,500,000	\$7,500,000
4	\$2,500,000	\$10,000,000
5	\$2,500,000	\$12,500,000



Financial Equivalency Calculator for Healthcare Facilities

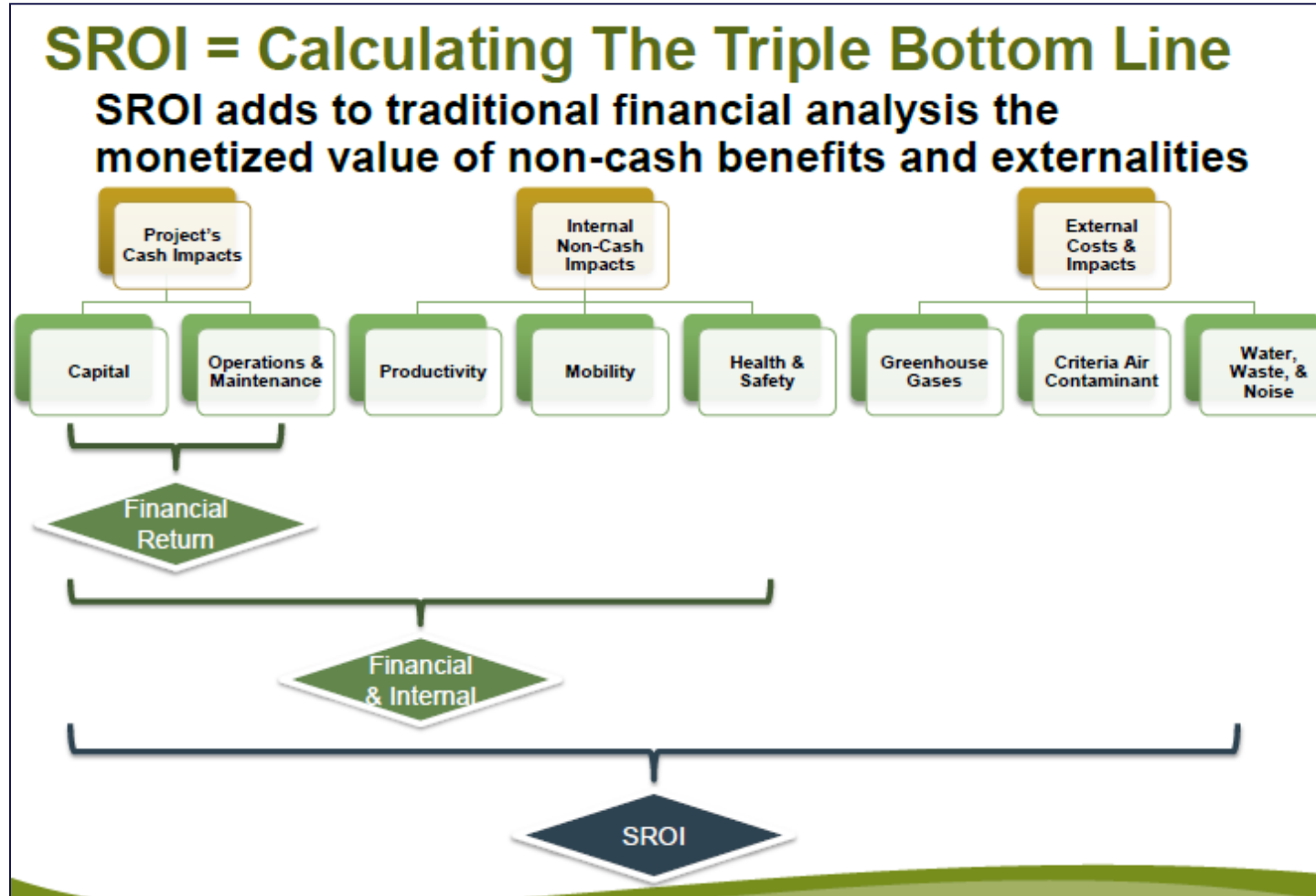


# Revenue Equivalent Loss associated to EEPS assessments.

## Net Patient Revenue Equivalent Loss

Hospital	EEPS Annual Assessment	Operating Margin	1 Year	5 Years – Cumulative	10 Years - Cumulative
A	\$25,000	2%	\$1.25 mil	\$6.25 mil	\$12.5 mil
B	\$50,000	2%	\$2.5 mil	\$12.5 mil	\$25 mil
C	\$100,000	2%	\$5 mil	\$25 mil	\$50 mil
D	\$200,000	2%	\$10 mil	\$50 mil	\$100 mil
Sector	\$1,300,000	2%	\$65 mil	\$325 mil	\$650 mil

# Sustainable Return on Investment



# What are your hospital's related costs and health impacts associated with your utility emissions?

## Energy Impact Calculator



	Annual Quantity	Generator's Costs for the Right to Emit Pollutants
SO2 (Tons):	111.4	\$61,000 per year
NOx (Tons):	26.7	\$78,800 per year
CO2 (Tons):	22,891.9	\$732,500 EU pricing
Carbon (Metric Tonnes)	5,663.8	N/A
Mercury (lbs):	1.0738	\$69,800 per Year
		\$942,100

Example:  
29.5 kWh per year

	Number of Incidents/Year	Societal Value/EPA	Direct Medical & Other Costs
Premature Mortality	0.35	\$2,363,784	\$105,684 per year
Chronic Bronchitis	0.22	\$105,632	\$27,232 per year
Hospital + ER Visits	0.32	\$4,276	\$3,386 per year
Asthma Attacks	7.18	\$423	\$423 per year
Respiratory Symptoms	342.2	\$12,558	\$12,558 per year
Work Loss Days	63.2	\$11,486	\$10,724 per year
Mercury Related	NA	\$151,541	\$151,541 per year
Health Impact			
Total Value/Cost (in 2008)		\$2,649,701	\$311,549 per year
Value of Unintended Societal & Direct Health Impacts per kWh		\$ 0.08986	\$ 0.01057

[www.eichealth.org](http://www.eichealth.org)

# Comparing multiple financial metrics can strengthen case and support better decision making.



**Table 1**

Comparing the Profitability of Upgrade Options

	Upgrade Option 1A		Upgrade Option 1B	
	Occupancy Sensors		Central Timeclock	
Year	Initial Cost	Savings Generated	Initial Cost	Savings Generated
0	\$42,000	\$0	\$9,000	\$0
1	0	\$12,200	0	\$3,550
2	0	\$12,200	0	\$3,550
3	0	\$12,200	0	\$3,550
4	0	\$12,200	0	\$3,550
5	0	\$12,200	0	\$3,550
6	0	\$12,200	0	\$3,550
7	0	\$12,200	0	\$3,550
8	0	\$12,200	0	\$3,550
9	0	\$12,200	0	\$3,550
10	0	\$12,200	0	\$3,550
<b>Over Ten Years</b>		\$122,00	0	\$35,500
<b>Simple Payback</b>		3.4 years		2.5 years
<b>IRR</b>		26%		38%
<b>NPV</b>		\$7,623		\$4,903

Source: Energy Star Building Manual, pg 7

**Table 2**

Assemble a Profitable Package

	Lighting Options	NPV	First IRR	Annual	Cash Flow Net Cost
1a	Occupancy Sensors	\$7,623	26%	\$42,000	\$12,200
1b	Central Timeclock	\$4,902	38%	\$9,000	\$3,550
2	LED Exit Signs	\$5,606	73%	\$3,250	\$2,380
3	Upgrade Corridor Lighting	\$5,106	38%	\$9,490	\$3,725
4	Upgrade Office Lighting	\$4,751	23%	\$57,605	\$15,100
5	Improve Task Lighting	(\$929)	16%	\$9,500	\$2,000
6	Daylight Dimming Controls	(\$26,524)	2%	\$59,080	\$6,500
	<b>Options 1a-4</b>	\$23,091	27%	\$112,345	\$33,405
	<b>Options 1a-5</b>	\$22,161	26%	\$121,845	\$35,405
	<b>Options 1a-6</b>	(\$4,363)	19%	\$180,925	\$39,905

Source: Energy Star Building Manual, pg 8





## Life Cycle Cost Analysis

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The Joint Commission



## Peoples Gas Rebate Update

Jim Hauser | Energy Advisor

Peoples Gas & North Shore Gas Natural Gas Savings Program

Commercial and Industrial Programs

5450 N. Cumberland Ave., Suite 125 | Chicago, IL 60656

(312) 878-0038 ext. 2673 Phone | (773) 853-2205 Fax | (815) 614-0555 Cell

[www.peoplesgasdelivery.com](http://www.peoplesgasdelivery.com) | [www.northshoregasdelivery.com](http://www.northshoregasdelivery.com)



# Announcements

- IFF
  - Energy Loans at 3.5%
  - Project management at no additional cost
- Building Operator Certification training
  - \$500 rebate available
- Portfolio Manager
  - June 2013 - upgrade launch
- Water bill exemption contact information
  - Brian | Water Billing and Collections  
333 S State St Ste 330 Chicago IL 60604 | Hours: M-F 8:30am-4:30pm  
Phone: 312.744.4420 | Fax: 312.742.9153 | [waterbill@cityofchicago.org](mailto:waterbill@cityofchicago.org)
  - Need water account number and/or amount of last payment

## ***Key Improvements***

- Expedited Energy Star certification
- Increased charts, graphs, data spreadsheets, and reports
- Expanded Water meter tracking
- Sustainability checklist
- Easier account sharing



Thank You