

Clarence White Conference & Tradeshow

Energy Monitoring, Measurement & Reporting

November 02, 2010

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Utility Monitoring – Reasons/Issues

- Try to reduce or eliminate fiscal waste to address budgetary, emission and public expectation concerns
- Budgetary waste could be re-allocated to direct patient healthcare
- Allocate limited resources (staffing/budget) to areas that produce the best return
- Difficult to compare apples to apples within diverse building portfolio
- Building with a higher energy intensity may be outperforming a building with lower energy intensity

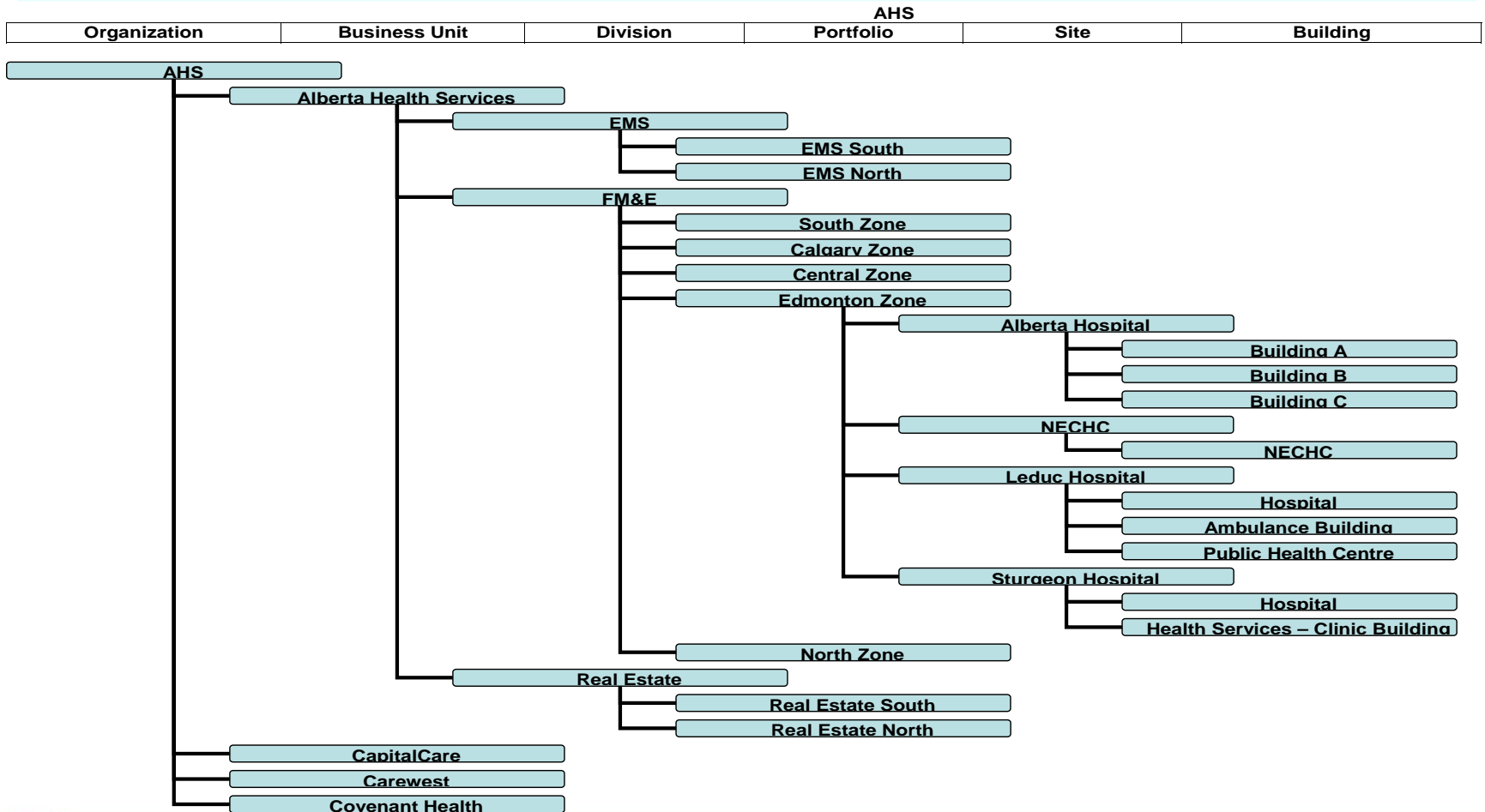
EnergyCAP - Overview

- Can't manage what you can't measure
- Instant visibility to any type of utility data from client group (Real Estate North, Real Estate South, FM&E each zone, Carewest, CapitalCare, Covenant from any level to a single meter utilizing powerviews
- Over 250 predefined reports on consumption, budgets, variance reporting, cost avoidance, GHG emissions, etc
- Customized reports automatically generated and emailed
- Benchmarking by facility type, zone, business type

EnergyCAP - Overview

- Cost avoidance in order to measure & verify cost savings
- Budgeting and accruals
- Utility invoice auditing
- Rollout to first group of FM&E staff for review for January 2011
- Sophisticated analytical tools
- Interface with accounting system for direct payment
- Import interval data

EnergyCAP – Tree Structure



EnergyCAP - Summary

Setup

- Facilities
- Weather Stations
- Contacts
- Groups
- Routes
- Users

Facility Manager

- CITY [City Facilities]
 - C [c]
 - D1 [Administration]
 - B4 [Administration]
 - M14G3 [M14G3]
 - M17E7 [M17E7]
 - FIRE [Fire Dept HQ]
 - POLICE [Police Dept H
 - D3 [Budget & Fiscal Operat
 - B6 [Donovan Bldg]
 - B7 [Fiscal Ops]
 - D4 [General Services]
 - B8 [Clinton Tower]
 - M20G6 [M20G6]
 - B9 [Office Building]
 - D5 [Constituent Services]
 - MASTER [Master Accounts]
 - MAIN-SSE [Main Substatio

Place Properties

Code [CITY](#)

Display City Facilities

Location Facilities

Place Type Organization

Contact -

Weather Station


[Cost Avoidance](#)

New Place 4.6 / 5 Edit Readings Move Options Find Meter

CAP

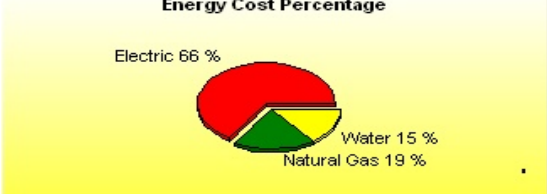
Fiscal Year Summary [Click Chart for Description](#)

Total Cost Summary



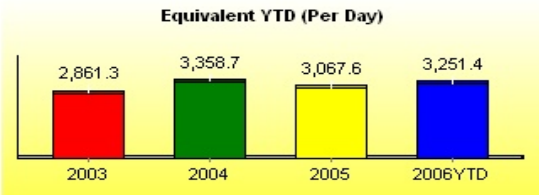
Year	Total Cost
2003	714,861
2004	1,125,404
2005	1,068,899
2006 YTD	583,027

Energy Cost Percentage



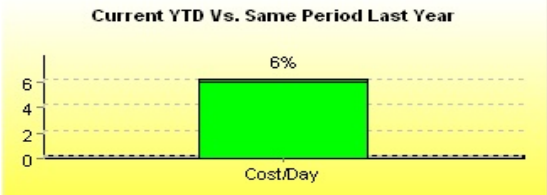
Category	Percentage
Electric	66%
Water	15%
Natural Gas	19%

Equivalent YTD (Per Day)



Year	Equivalent YTD (Per Day)
2003	2,861.3
2004	3,358.7
2005	3,067.6
2006 YTD	3,251.4

Current YTD Vs. Same Period Last Year



Category	Value
Cost/Day	6%

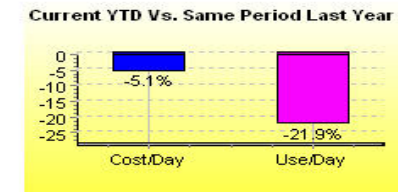
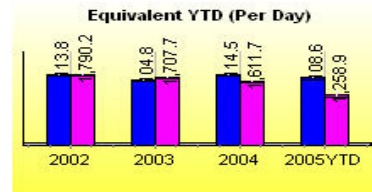
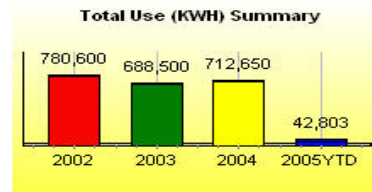
Floor Area	Unit	Effective Date
Place User Defined Fields		
General / Commodity / Monthly /		

EnergyCAP - Comparison

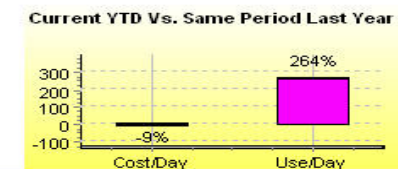
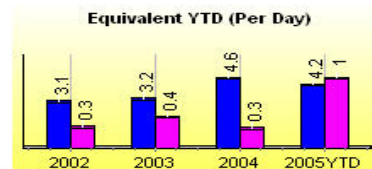
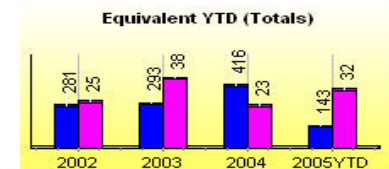
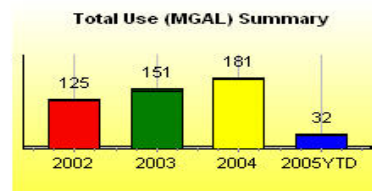
Facility Manager

- Facilities
 - 1 - US Stores
 - NORTH AREA
 - DIVISION 1
 - DIVISION 2
 - DIVISION 3
 - DISTRICT 301
 - DISTRICT 302
 - 0109-FORT SMITH
 - 0123-ROGERS
 - 0501-MEMPHIS
 - 0501E
 - 0501G
 - 0501W
 - 0516-LITTLE ROCK
 - 0545-HUNTSVILLE
 - 0653-NORTH LIT
 - 0658-FLORENCE
 - DISTRICT 303
 - DISTRICT 304
 - DISTRICT 305
 - DISTRICT 306
 - DISTRICT 307
 - DISTRICT 308
 - DIVISION 4
 - DIVISION 9
 - SOUTH AREA
 - 2 - International Stores
 - 3 - Other Facilities

Electric



Water

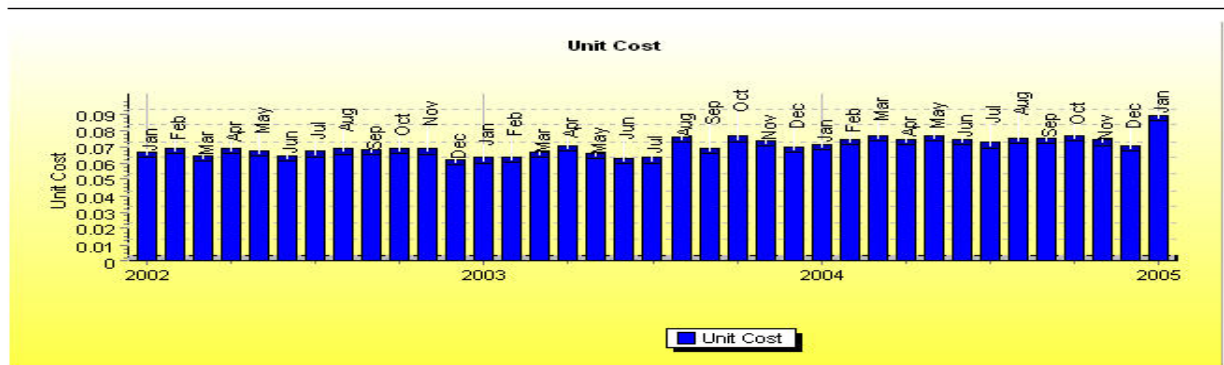
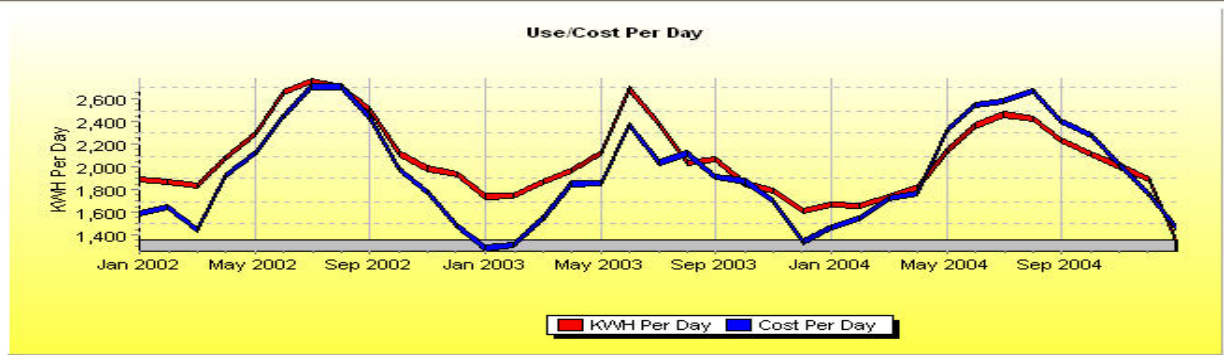


General Commodity Monthly

EnergyCAP - Commodity

Facility Manager

- Facilities
 - 1 - US Stores
 - NORTH AREA
 - DIVISION 1
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General Trends Monthly Bills Demand

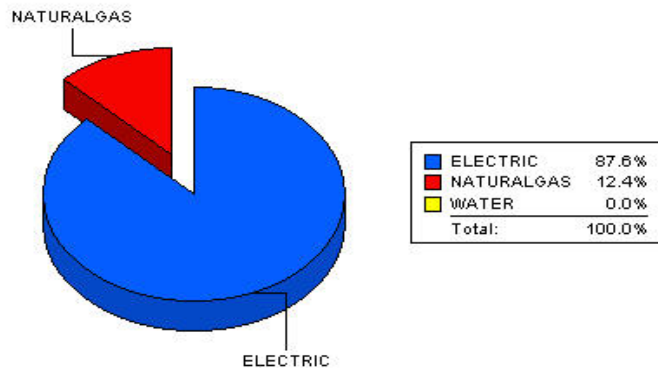
EnergyCAP – Executive Summary

National Retailer
Energy Tracking System

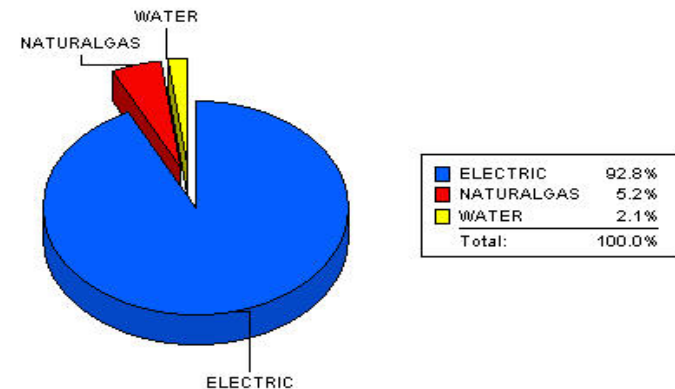
Executive Summary by Commodity BL - 12

Executive Summary by Commodity

Energy Use Percentage

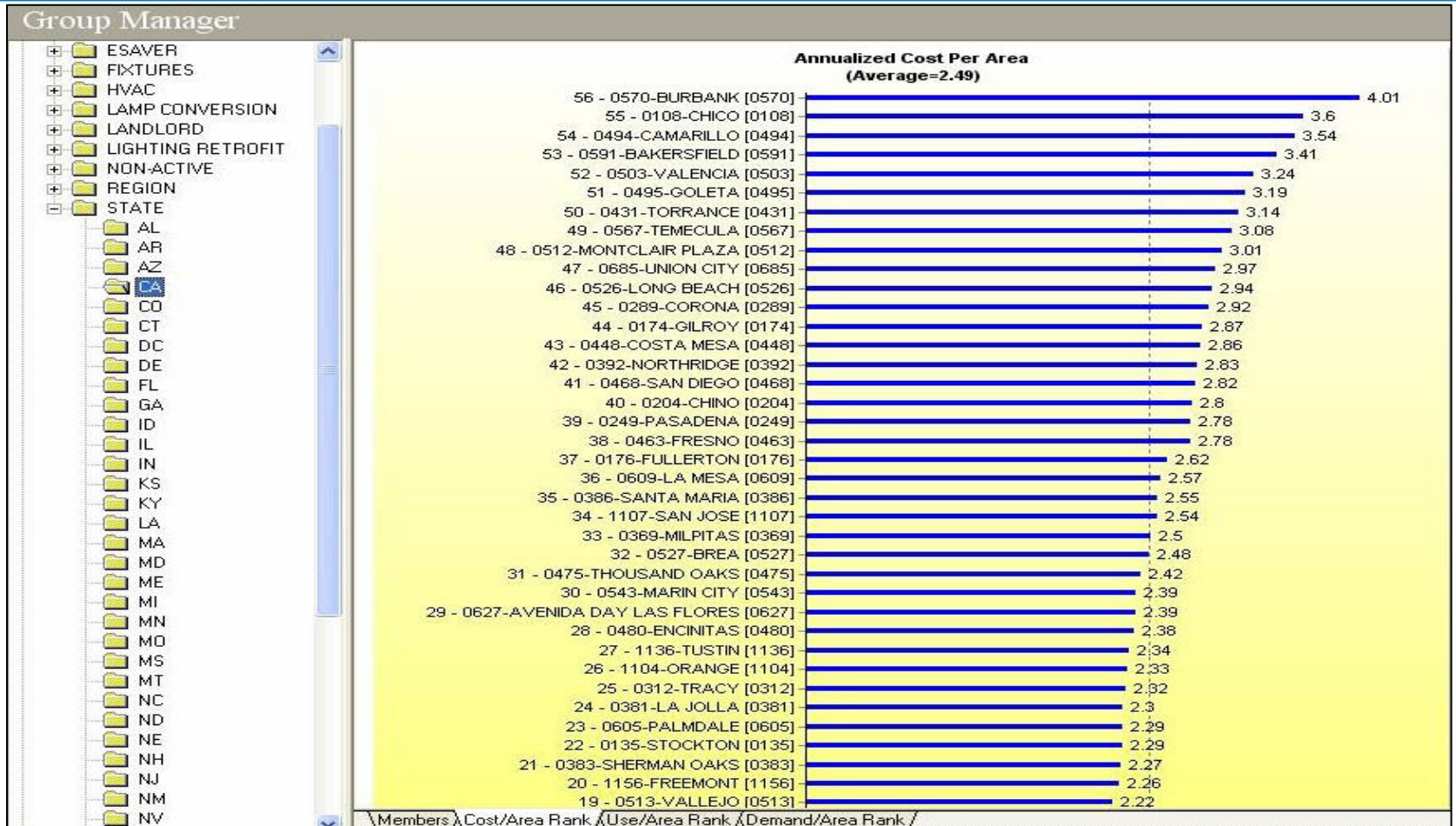


Cost Percentage



Commodity	Common Use	Energy Use MMBtu	Energy Percentage	Cost	Cost Percentage	Cost/Unit
Reporting Period: 12/07/2003 to 01/21/2005						
ELECTRIC	359,053,013 kWh	1,225,447.934	87.60%	\$31,112,599.72	92.77%	\$0.0867 / kWh
NATURALGAS	168,428 MCF	173,480.629	12.40%	\$1,734,664.74	5.17%	\$10.2992 / MCF
WATER	373,268 MGal			\$690,975.29	2.06%	\$1.8512 / MGal
Grand Totals:		1,398,928.563		\$33,538,239.75		

EnergyCAP - Benchmarking



EnergyCAP – Cost Avoidance

Setup

Analysis

Accounting

Reporting

Cost Avoidance

Savings and Normalizations

Issue Tracker

Cost Avoidance Manager

Code: locate 03304_E1
Info: 03304_E1-Engine #4

Savings Start: 1/1/2006
BaseLine Start: 1/1/2005

Months: 12
Electric

Include meter in Cost Avoidance Track Demand

End Month: Jul

Show Current Year
 Show Without CAP
 Show Base Year
 Show Savings

Select the Ending Month's Year

2007
 2006
 2005

Facilities

- City
 - Convention Center
 - Fire Dept
 - Fire-Administration
 - Fire-Stations
 - Engine 01
 - Engine 02
 - Engine 03
 - Engine 04
 - 03304_1G1-Engine
 - 03304_E1-Engine
 - Engine 05
 - Engine 06
 - Engine 07
 - Engine 08
 - Engine 09
 - Engine 10
 - Engine 11
 - Engine 12
 - Engine 13
 - Engine 14
 - Engine 15
 - Engine 16
 - Engine 17
 - Engine 18
 - Engine 19
 - Engine 20
 - Engine 20 (New)
 - Engine 30
 - z-Emergency-Sirens
 - General-Services
 - IT Services Dept
 - Library Dept
 - Parks & Rec Dept
 - Police Dept
 - Transportation Dept
 - Water & Waste Dept
 - Inactive, Misc
- Meter Groups
 - Category
 - Commodity
 - Group

Multi Year Comparison Use/Day



Multi Year Comparison Cost/Day



Savings
Use Vs Weather
CAP Comparison
Actual Comparison

EnergyCAP – Cost Avoidance

Code: **E41994**
Info: **ROSEMONT ELEMENTARY**

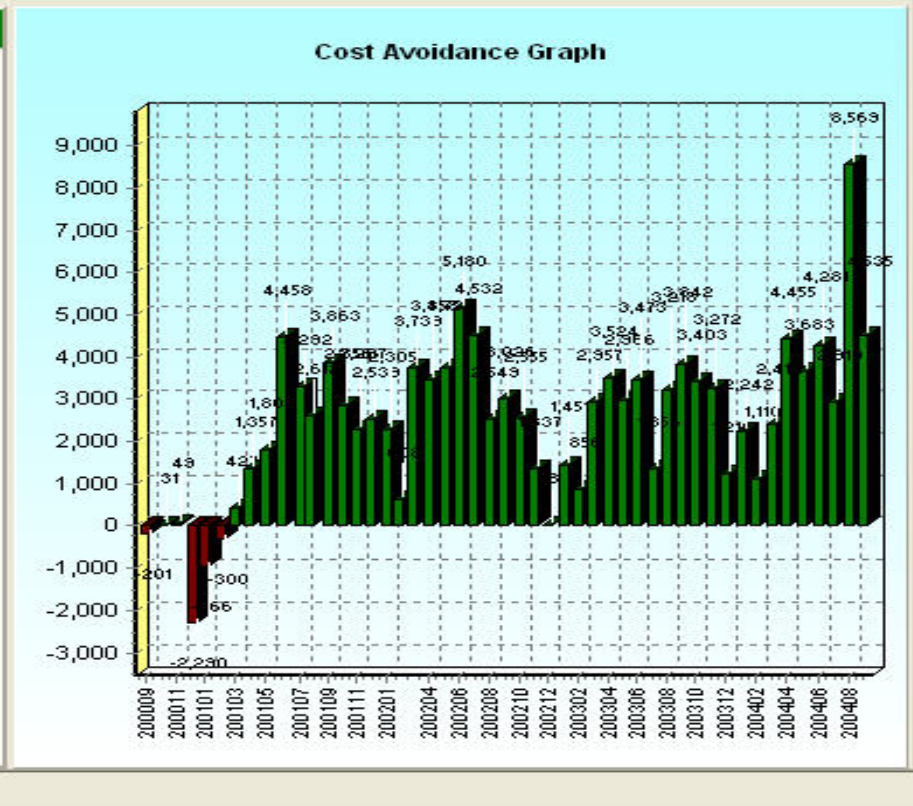
Savings Start: 10/01/2000
BaseLine Start: 10/01/1999

Months: 12
Electric




COST AVOIDANCE						
Period	Year	Without CAP Cost	Actual Cost	Cost Avoidance	Wthr Htg	Wthr Clg
Sep	2004	\$15,134	\$10,599	\$4,535		x
Aug	2004	\$17,015	\$8,447	\$8,569		x
Jul	2004	\$11,371	\$8,452	\$2,919		x
Jun	2004	\$13,564	\$9,283	\$4,281		x
May	2004	\$13,238	\$9,555	\$3,683		x
Apr	2004	\$11,965	\$7,510	\$4,455		x
Mar	2004	\$9,088	\$6,676	\$2,412		x
Feb	2004	\$7,972	\$6,862	\$1,110		x
Jan	2004	\$9,068	\$6,825	\$2,242		x
Dec	2003	\$7,082	\$5,864	\$1,218		x
Nov	2003	\$11,925	\$8,654	\$3,272		x
Oct	2003	\$12,299	\$8,896	\$3,403		x
Sep	2003	\$13,995	\$10,153	\$3,842		x
Aug	2003	\$13,859	\$10,641	\$3,218		x
Jul	2003	\$10,933	\$9,577	\$1,356		x
Jun	2003	\$11,160	\$7,687	\$3,473		x
May	2003	\$12,718	\$9,752	\$2,966		x
Apr	2003	\$12,518	\$8,994	\$3,524		x
Mar	2003	\$10,361	\$7,404	\$2,957		x
Feb	2003	\$8,261	\$7,405	\$856		x

Savings Use Vs Weather



EnergyCAP – Linear Regression

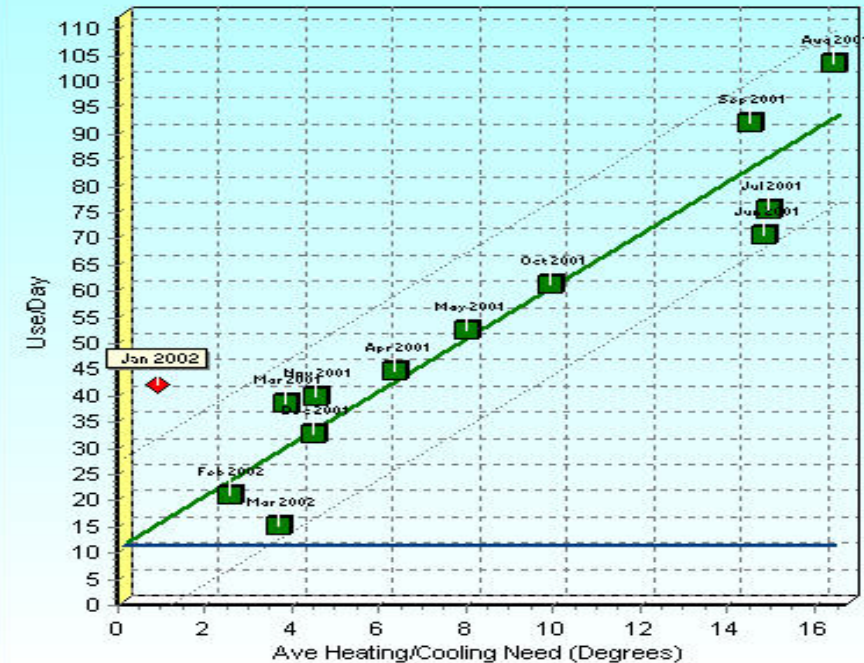
Code: **E79374**
Info: **RIVERSIDE ELEMENTARY SCHOOL**
Savings Start: **02/22/2002**
BaseLine Start: **02/22/2001**
Months: **12**
Electric 

Cooling Needed Above (Degrees) Attempt Summer
Heating Needed Below (Degrees) Attempt Winter

	Summer	Winter
R2	0.9000	0.0000
Min R2	0.2470	0.9761
Slope	5.00	-17.11
Inter	10.63	27.95

Display
 Summer
 Winter

Use Vs Weather



Year	Start	End	Avg Heating Need (Deg)	Use/Day	Days
2002	02/21/02	03/26/02	3.6	14.8	33
2002	01/24/02	02/21/02	2.5	20.8	28
2002	12/27/01	01/24/02	0.9	42.3	28
2001	11/26/01	12/27/01	4.5	32.3	31
2001	10/23/01	11/26/01	4.5	39.7	34
2001	09/24/01	10/23/01	9.9	61.0	29
2001	08/23/01	09/24/01	14.5	92.0	32
2001	07/25/01	08/23/01	16.4	103.4	29
2001	06/22/01	07/25/01	14.9	75.4	33
2001	05/23/01	06/22/01	14.8	70.4	30

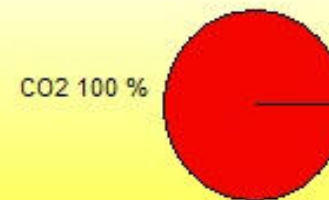
Savings
Use Vs Weather

EnergyCAP Emission Tracking

Greenhouse Gases By Category



Greenhouse Gases By Type



Greenhouse Gases By Commodity



Manual Entries / GHG Credits
Value

Billing Period

Memo

EnergyCAP Emission Tracking

City of _____
Energy CAP

		GHG Emissions GHG - 01	
		GHG Emissions	
Scope	Gas	Metric Tons of CO2E	
Scope Type: Direct			
Mobile	CO2		37.23
		Total for Scope Mobile: 37.2	
Stationary	CO2		50.13
	CH4		7.36
	N2O		0.01
		Total for Scope Stationary: 57.5	
		Total for scope type Direct: 94.7	
Scope Type: Indirect			
Purch Elec	CO2		28.06
		Total for Scope Purch Elec: 28.1	
		Total for scope type Indirect: 28.1	
		Grand total: 123	

Requested by:

Version: 5.0.0.123

Filters: Topmost Place Name Equals BRANCH 39; Billing Period(YYYYMM)s Equal Prior 12 months*; ;

Greening Health Care - Overview

- Collaboration of health care facilities in Ontario that share information, best practices and share utility data to benchmark against each other
- Participants meet every quarter in a workshop format
- Benchmarking analysis and completed by third party (Enerlife Consulting) that provides benchmarking, utility analysis and facilitates the workshops
- Slides 17 to 21 were from October 2010 workshop that included two AHS facilities

'The Size of the Prize' - Energy Targets

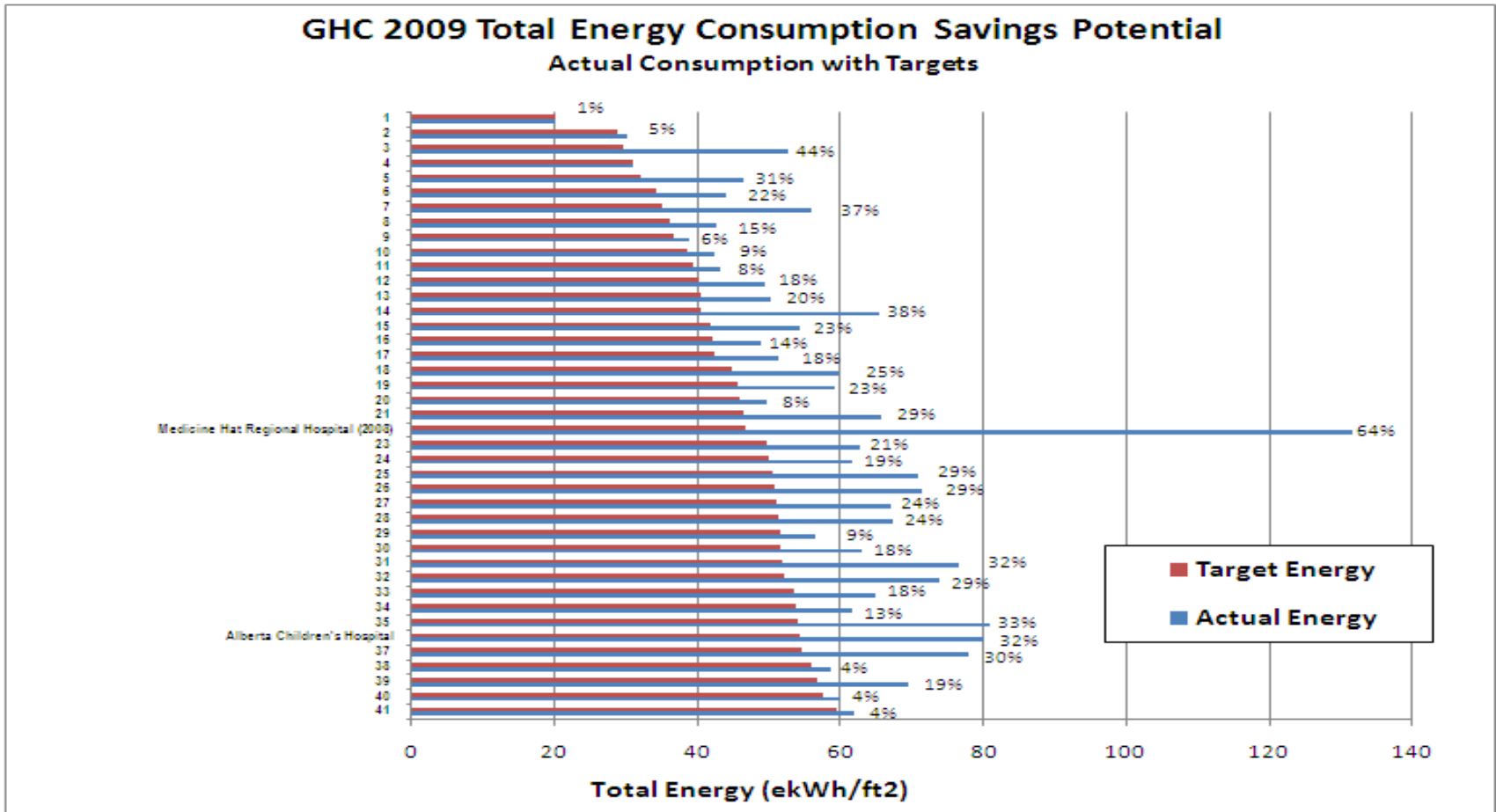
Energy targets by component (ekWh/ft2), based on current top quartile:

Hospital Type	Base Electricity	Cooling Electricity	Base Thermal	Heating Thermal	Adjustment Type	Adjustment Factor
Acute	19.5	1.8	14.0	25.5	Steam heat	0.75 (Multiplier)
Continuing Care	16.0	1.6	8.0	15.0	Laundry	10.0
					Absorption cooling	5.0
					Research equipment	5.0

Potential for savings (41 hospitals, 19.2 million ft2):

Total Energy (ekWh/ft2)			Cost Savings		GHG Emissions	
Actual Median	Target Median	Savings %	%	\$	Savings %	Savings (kt)
59.9	46.6	22.2%	21.4%	\$17,620,366	23.4%	54.1

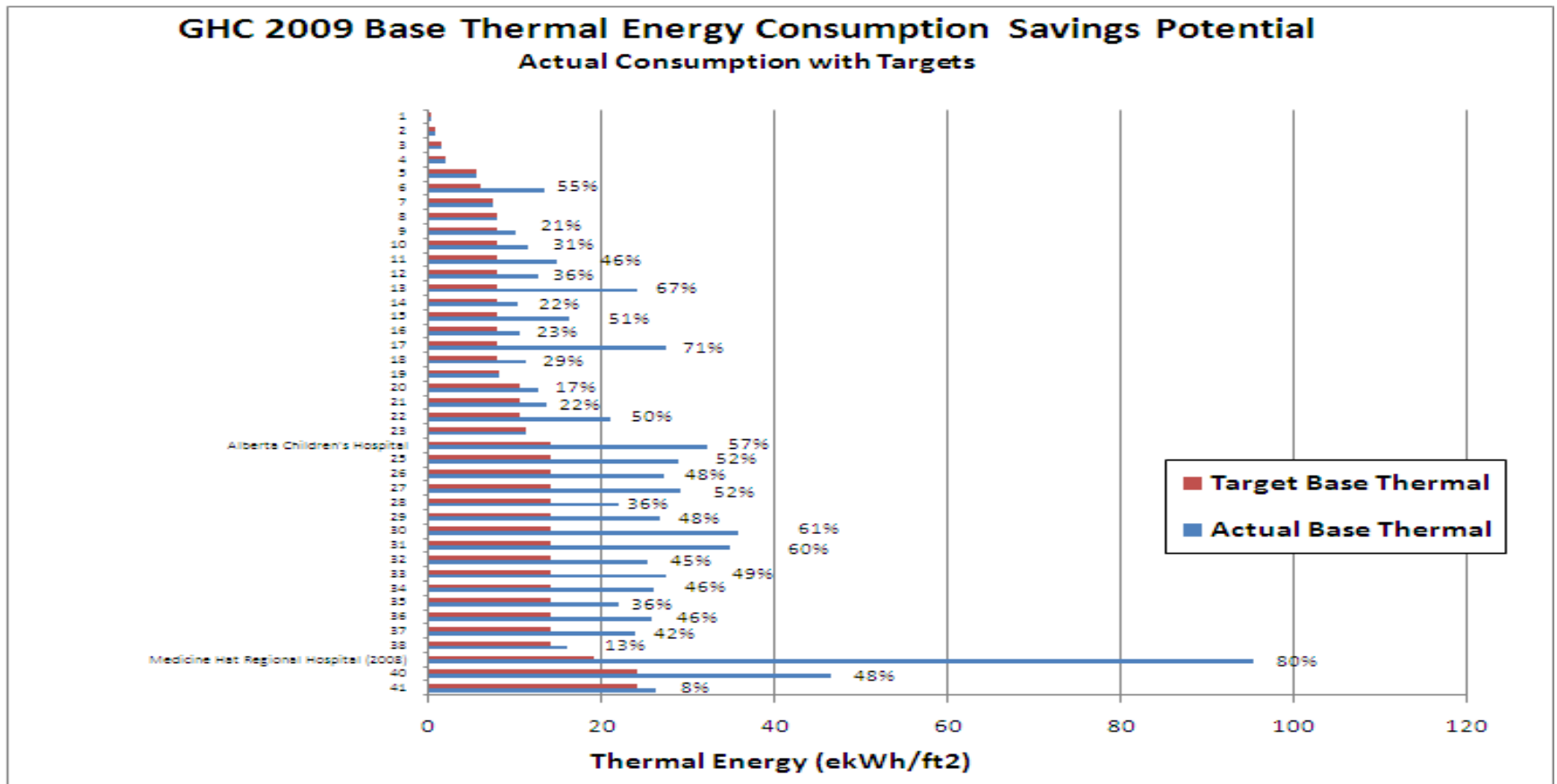
Total Energy Targets



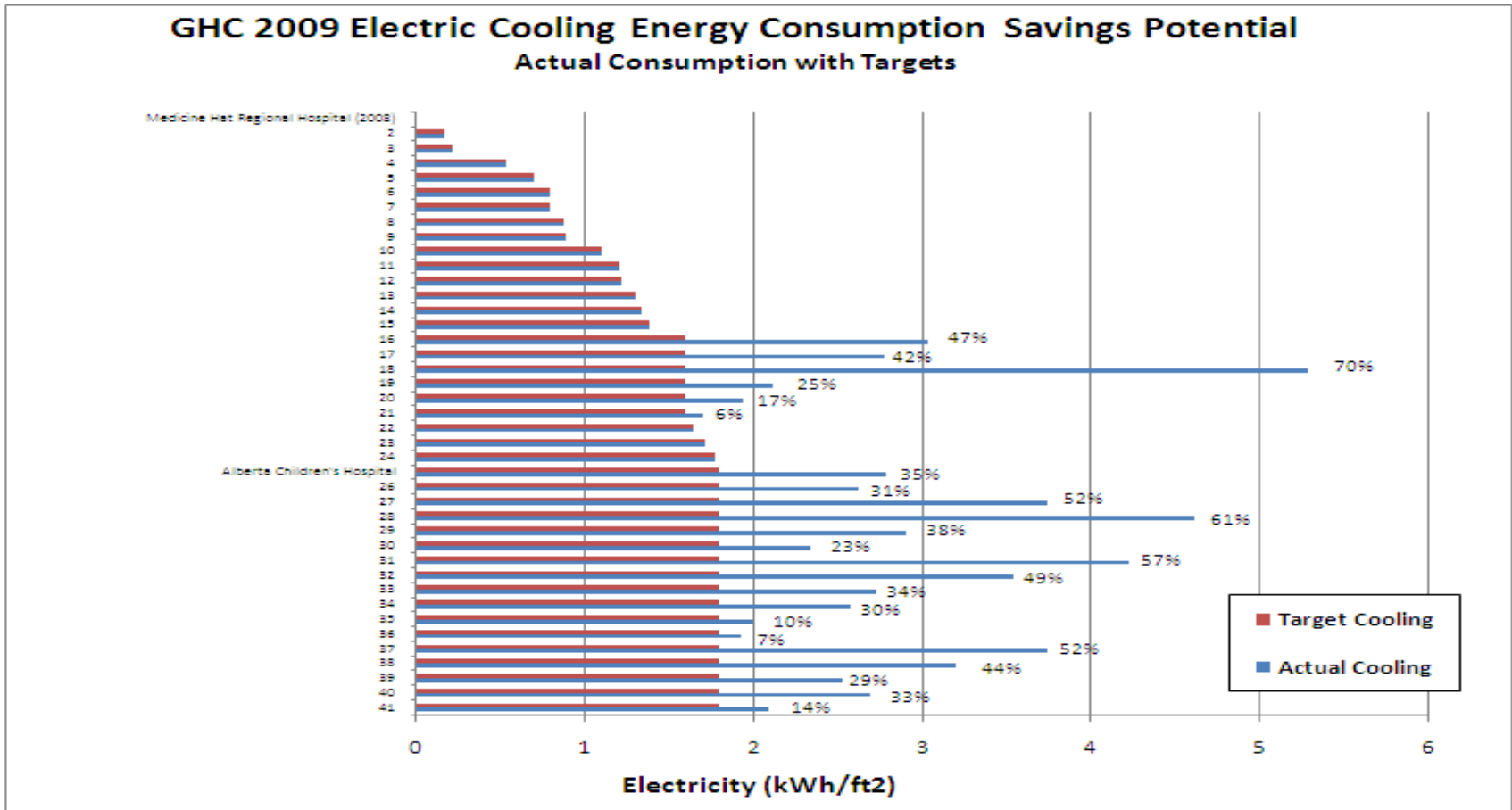
Energy Targets - 2009 Baseline

Hospitals	Electricity (ekW/ft2)				Thermal (ekWh/ft2)				Total Energy (ekWh/ft2)			Cost
	Base		Cooling		Heating		Base		Actual	Target	Savings %	Savings (\$)
	Actual	Target	Actual	Target	Actual	Target	Actual	Target				
Alberta Children's Hospital	25.7	19.5	2.8	1.8	19.3	19.1	32.2	14.0	80.1	54.4	32.0%	\$1,366,194
Medicine Hat Regional Hospital (2008)	27.9	19.5	0.0	0.0	8.3	8.3	95.3	19.0	131.5	46.8	64.4%	\$1,576,056

Base Thermal Targets



Electric Cooling Targets



Energy Monitoring - Future

- Rollout of EnergyCAP to various user groups and stakeholders in a phased program – at the end of the program any AHS employee will have access
- Develop custom reports to interested stakeholders
- Develop web page to provide information utilities and energy management for work & home
- Utilize Greening Health Care to optimize operating conditions on heating base load and A/C load
- Pilot project to utilize Energy Star