



# Energy Investment Successes from a Hospital CFO

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S320G

Wednesday, June 24, 7:00 AM - 7:50 AM



# Objectives

- Communicate the benefits of peer-to-peer exchange to identify and share best practices for energy management and sustainability investment.
- Highlight proven and replicable solutions for energy efficiency utilized by prominent healthcare organizations.
- Introduce EnergyforHealthcare.org, a new website supported by Practice Greenhealth and DOE's Better Buildings Alliance to create a forum for healthcare CFOs to share case studies and best practices, and to learn from one another.
- Discuss the project teams, resources, and activities focused on improving energy efficiency available to healthcare organizations through DOE's Better Buildings Alliance.



# Agenda

- Overview of Better Buildings Initiative
- Benefits of Energy Efficiency
- Case Study: Gundersen Health
- CFO Perspectives Website: [EnergyforHealthcare.org](http://EnergyforHealthcare.org)



# The Better Buildings Initiative

- DOE first began working with market partners in 2008 to further energy efficiency through the Better Buildings Alliance.
- The [Better Buildings Alliance](#) and the [Better Buildings Challenge](#) are the cornerstones of DOE's efforts to develop innovative, replicable solutions to help market partners save energy.
- The programs play a crucial role in helping move our country closer to the Administration's [Better Buildings Initiative](#) target of 20% energy savings by 2020.
- Cutting the energy use of U.S. buildings by 20% from current levels would save approximately \$80 billion annually on energy bills, reduce greenhouse gas emissions, and create thousands of jobs.



# Better Buildings Challenge

- Improving efficiency
  - Increase energy efficiency by 20% over ten years in commercial, industrial, and multifamily buildings
- Market Leadership
  - Almost 200 partners representing 3.3+ billion square feet
- Transparent Solutions
  - Partners implement and share replicable solutions to common barriers
- Real Results
  - Showcase projects demonstrate successful energy reduction strategies



# Better Buildings Alliance

- **Neutral, third party platform** for sector peers to address common energy challenges
- More than **200 organizations** representing **10 billion square feet**
- Achieving real solutions to technical and market barriers through **12 project teams and working groups**
- Participation is free! Members are asked to:
  - Set and share an energy saving goal (encouraged to be 2% per year)
  - Participate on one Alliance activity per year

For more information: [eere.energy.gov/betterbuildingsalliance](http://eere.energy.gov/betterbuildingsalliance)



# Better Buildings Alliance Commercial Building Sectors

The Better Buildings Alliance welcomes members in a variety of commercial building sectors:

**SECTOR TEAMS**

	<b>COMMERCIAL REAL ESTATE &amp; HOSPITALITY</b>
	<b>HEALTHCARE</b>
	<b>HIGHER EDUCATION</b>
	<b>RETAIL, FOOD SERVICE &amp; GROCERY</b>

- The Better Buildings Alliance represents nearly 200 member organizations and approximately 10 billion commercial square feet across key market sectors.
- Members agree to: participate in at least one Alliance activity each year and share their successes with their peers.
- DOE commits to: connect members with technical resources, and provide a platform for peer exchange.



# About Better Buildings

## Better Buildings Challenge Snapshot, 2014

Membership	
Number of Partners and Allies	250+
Square Feet Represented	3.5 billion
New Members in 2014	60
Solutions	
Partner Solutions Available for Replication	160+
Results	
Energy Saved (Btus)	94 trillion
Dollars Saved	\$840 million
Avoided CO <sub>2</sub> e emissions (tons)	5.8 million
Funding Committed/Placed	\$5.5 billion / \$3 billion

## Better Buildings Alliance Snapshot, 2014

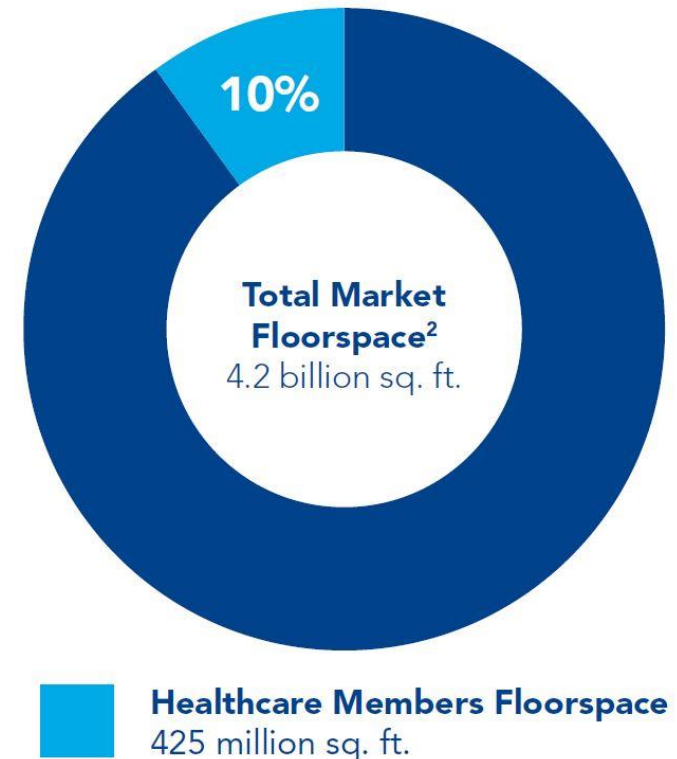
Membership	
Number of Member Organizations	185
Square Feet Represented	10 billion
Percent of U.S. Commercial Buildings	11%
New Members in 2014	14
Activities	
Energy Savings Activities Available to Members	50+
Results	
Increase in Member Activity in 2014	More than 20%
Average Annual Energy Savings Reported	More than 2%



# The Healthcare Sector

- 28 members 425 million sq. ft.
- 10% of the sector's 4.2 billion square feet in the U.S.
- Top 3 Technology Teams:
  - Lighting & Electrical
  - Space Conditioning
  - Energy Management Information Systems
- Key Links
  - [Sector Webpage](#)
  - [Sector Opportunities document](#)

## Healthcare Members as a Percent of Market Floorspace



# Better Buildings Alliance Healthcare Members

- **Ascension Health\***
- Beaumont Health System\*
- Bon Secours St. Francis Health System
- Broward Health North
- Catholic Health Initiatives (CHI)
- CentraCare Health System
- **Cleveland Clinic Foundation\***
- Defense Health Agency (DHA)
- Gundersen Health System\*
- Health Care REIT
- HealthSouth
- Hospital Corporation of America
- Inova Health System
- Kaiser Permanente
- Legacy Health System\*
- Lincoln Harris
- Mayo Clinic
- **New York-Presbyterian Hospital\***
- North Shore-Long Island Jewish Health System
- Providence Health & Services
- Southwestern Vermont Health Care
- Summa Health System
- U.S. Department of Veterans Affairs
- University of Maryland Medical Center\*
- **University of Pittsburgh**
- **Medical Center\***
- University of South Alabama Medical Center
- Veterans Health Administration
- Westchester Medical Center

\*Steering Committee Member

Members in **bold** have taken the Better Buildings Challenge

**There are currently 28 members in the Healthcare Sector, accounting for over 400 million sq. ft. of space.**



# Benefits of Energy Efficiency Projects

- Financial cost savings

## *But also...*

- Improved patient care
- Better healing environments
- Improved safety
- Risk mitigation
- Environmental benefits
- Positive PR
- Improved lighting quality
- And more!



# Sustainability Investment A CFO's Perspective

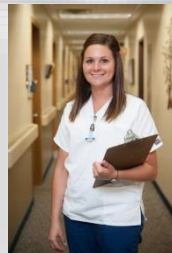
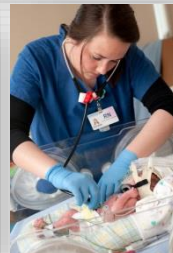
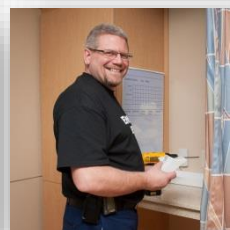


**Mike Allen** - *Chief Financial Officer*, Gundersen Health System

Envision®  
Gundersen Health System

**Mission:** To minimize human disease and harm to the environment caused by our consumption in care delivery, while making healthcare more affordable for patients.





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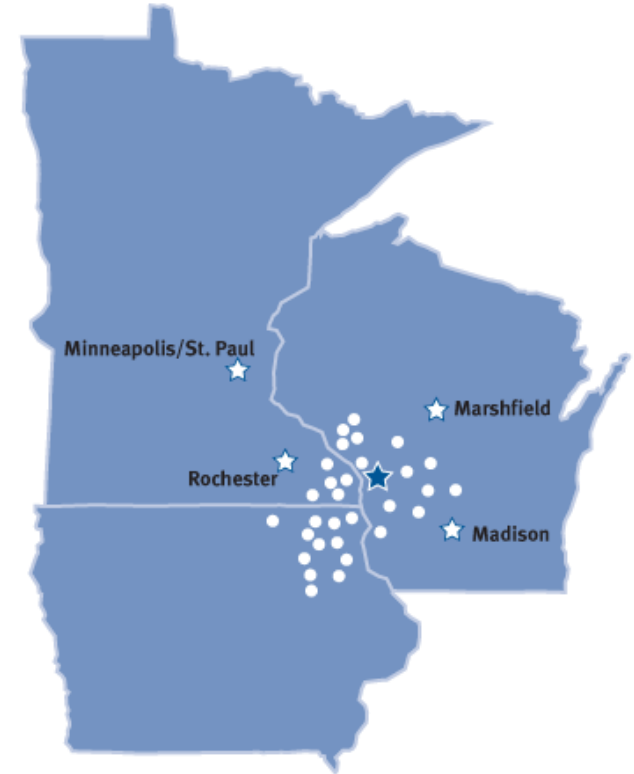
# The Green of Green



We will improve  
health & lower cost



# *Gundersen Health System*



- ❖ An Integrated Delivery System
- ❖ 65 Clinic locations; Primary and Specialty Care
- ❖ 5 Hospitals including behavioral health
- ❖ Medical Foundation
- ❖ 6,475 total employees
  - **522 Physicians**
  - **301 Associate Staff**



We did not set out to be the greenest health system.

We set out to make the air better for our patients to breathe, control our rising energy costs and help our local economy.

We believe we have made substantial progress on all three.





# Why Should Health Care Providers Care?

- Pollutants from the burning of fossil fuels and waste disposed:
  - Cancer, liver disease, kidney disease, reproductive issues
  - Cardiovascular deaths and stroke<sup>1</sup>
- Hospitals are 2.5 times more energy intensive than other commercial buildings<sup>2</sup>
- Reducing waste results in an improved bottom line

<sup>1</sup>Source: American Heart Association Scientific Statement: DALLAS, May 10, 2010

<sup>2</sup>Source: <http://www.energy.gov/news2009/7363.htm>



# Beyond the Health & Money

- Staff Pride
  - For being environmentally sound
  - For innovating ahead of the norm
  - For not settling for mediocrity



# *Gundersen's Envision® Program*



- **Energy Management**
- **Waste Management**
- **Recycling and Re-use**
- **Sustainable Design of Facilities**



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Our First Fuel

# ENERGY MANAGEMENT



# 25% Energy Efficiency Improvement

**Capital Investment = \$2.1M**

**Annual Benefit = \$1.7M**

## Significant Projects

- Scheduling adjustments to Heating, Cooling, and Lighting systems
- Lighting retrofit
- Chiller replacements
- Electronic controls retrofits
- Insulation of pipes, fittings, mechanical rooms
- PC shutdown software



# Clean Energy Production

**Capital Investment = \$32.5M**

**Annual Benefit = \$2.6M**

## Significant Projects

- Biomass Boiler (woodchips) with Steam Turbine – 38% of energy goal
- Dairy Biogas (cow manure digesters) – 18% of energy goal
- Landfill Gas – 10% of energy goal
- Wind – 10% of energy goal



# Landfill Gas Project

- Partnered with La Crosse County Solid Waste Department
- Project offsets 100% of Onalaska campus energy needs ~11% of total goal
- Started production in March 2012
- **The first known, Energy Independent Healthcare Campus in the U.S.**



# Biomass Boiler Project

Renewable, Locally Sourced, Wood Chip Fuel

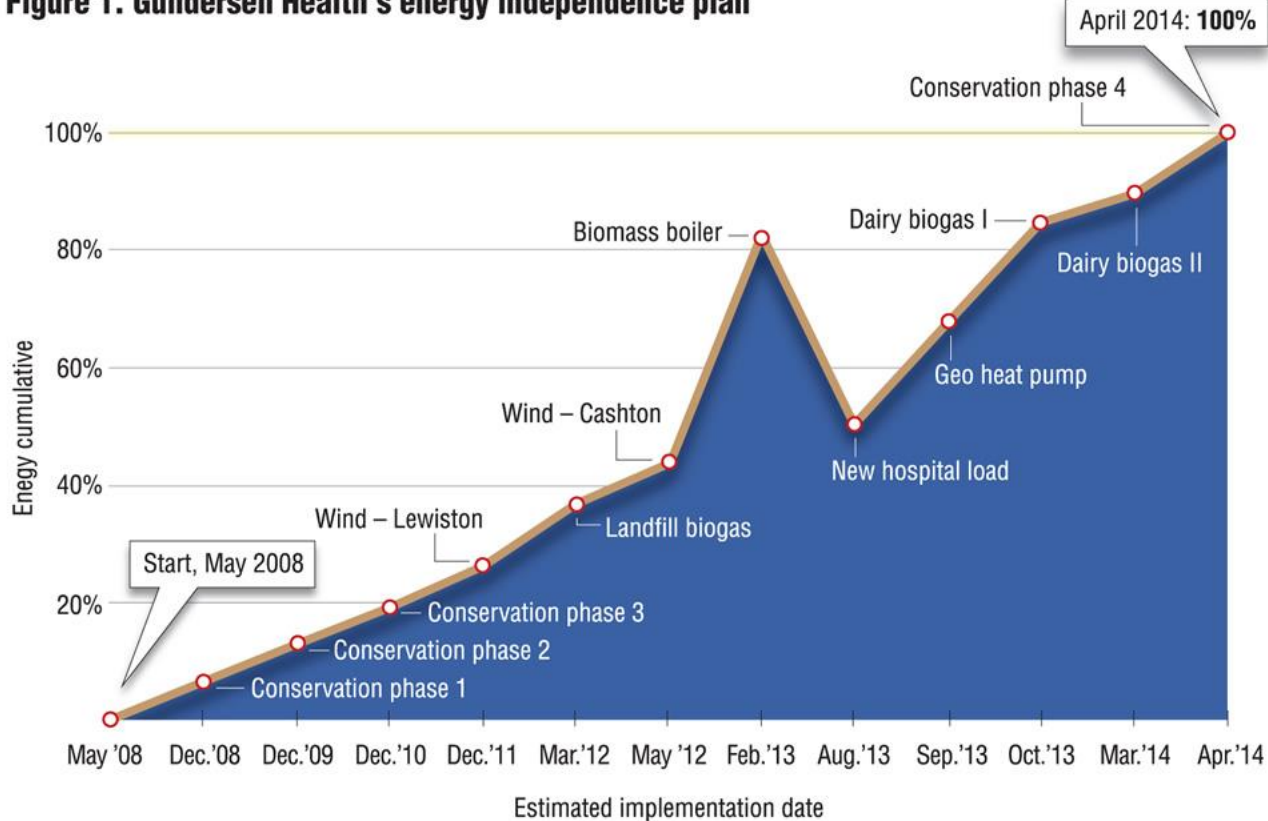
- 38% of energy independence goal (~150,000 MMBtu and 2,500,000 kWh)
- Will produce the majority of heat / steam used by the health system
- On-site electricity production with back pressure steam turbines
- Started production February 2013





# 1<sup>st</sup> U.S. Health System with all of our 5 Hospitals Heat, Power & Cooling offset by our own Local Renewable Energy

**Figure 1. Gundersen Health's energy independence plan**



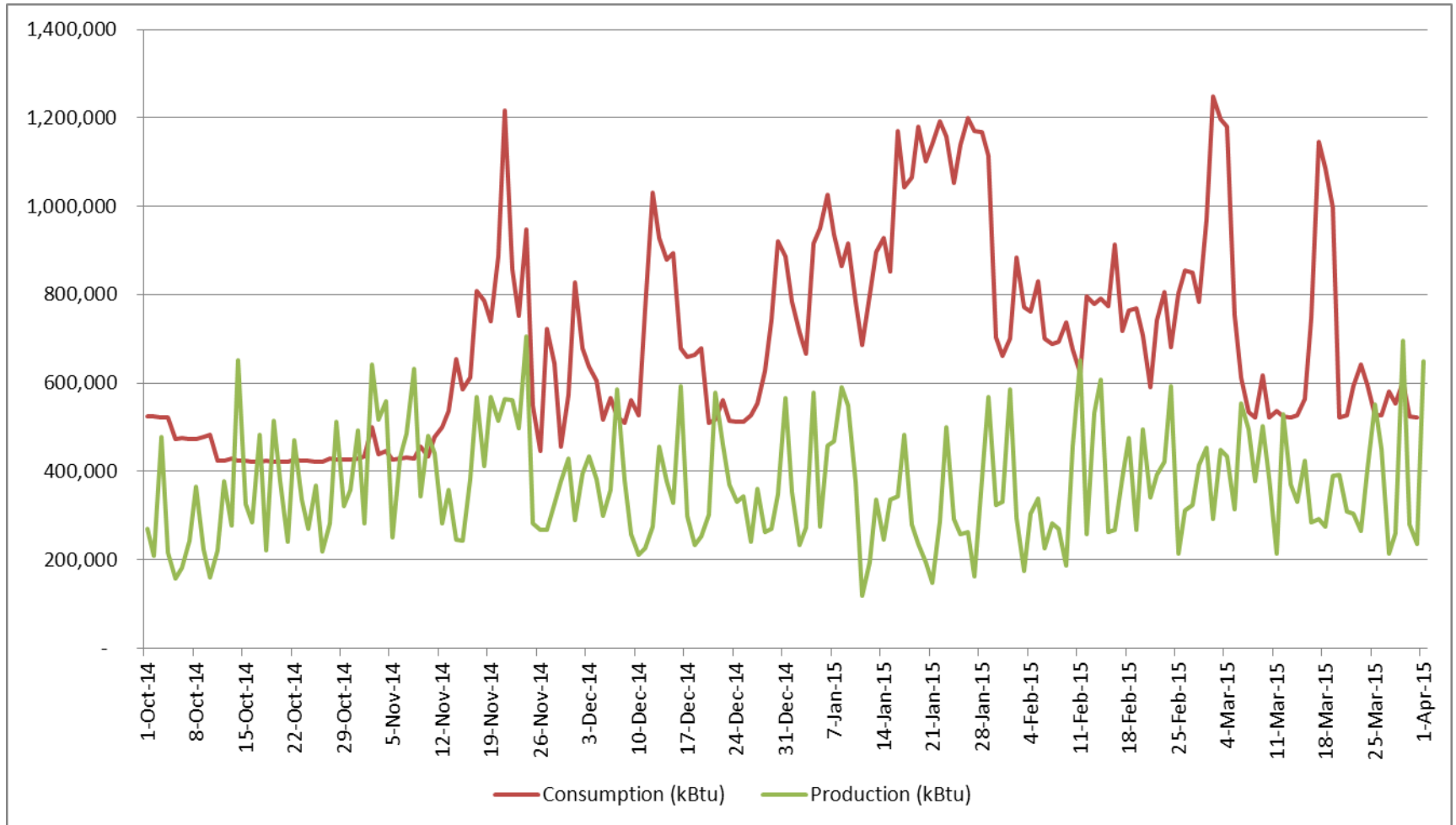
**We will improve health & lower cost**  
 U.S. DEPARTMENT OF ENERGY  
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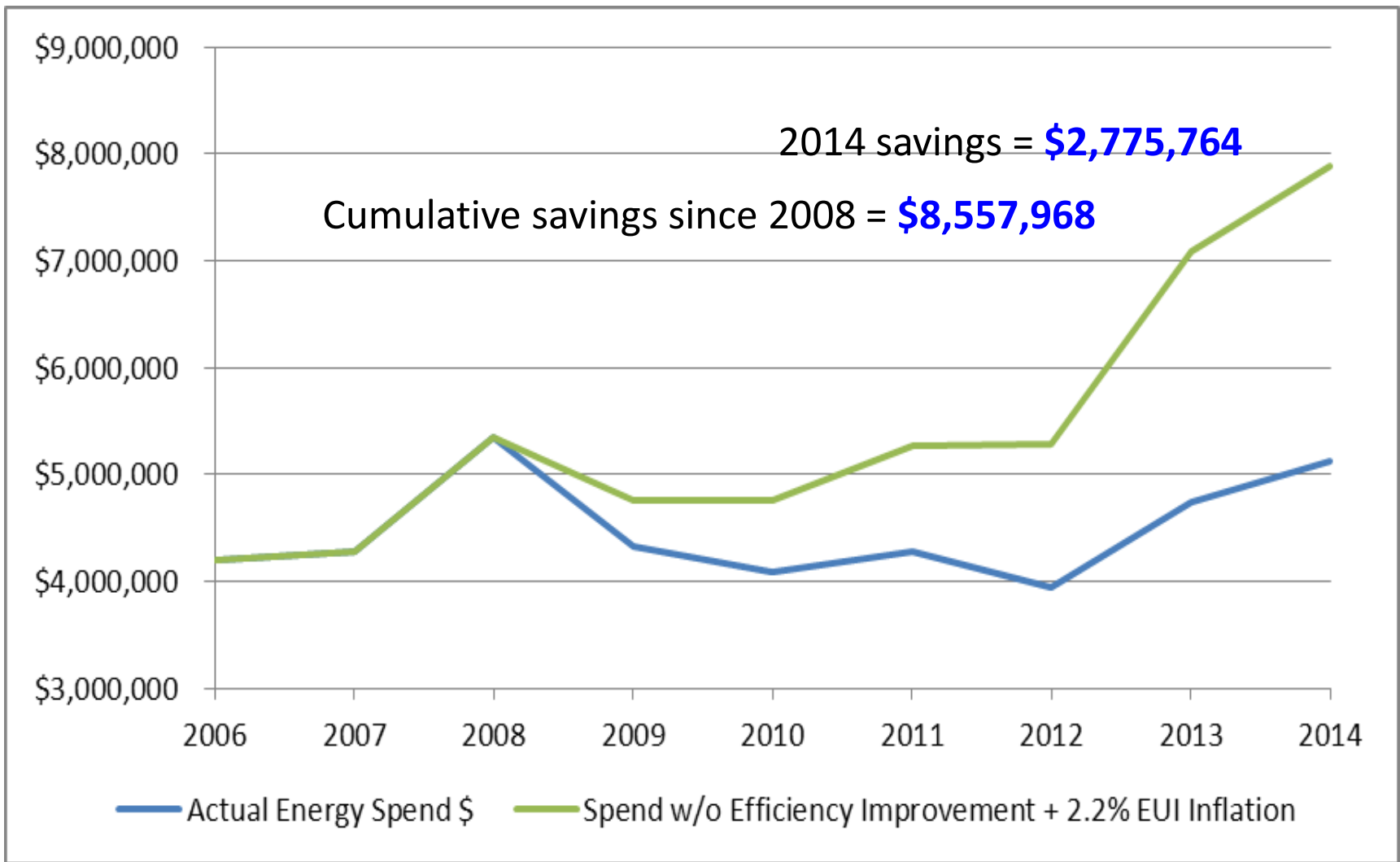
# Daily Energy Independence Chart



4 days of energy independence in March  
(21 total since 10/14/14)

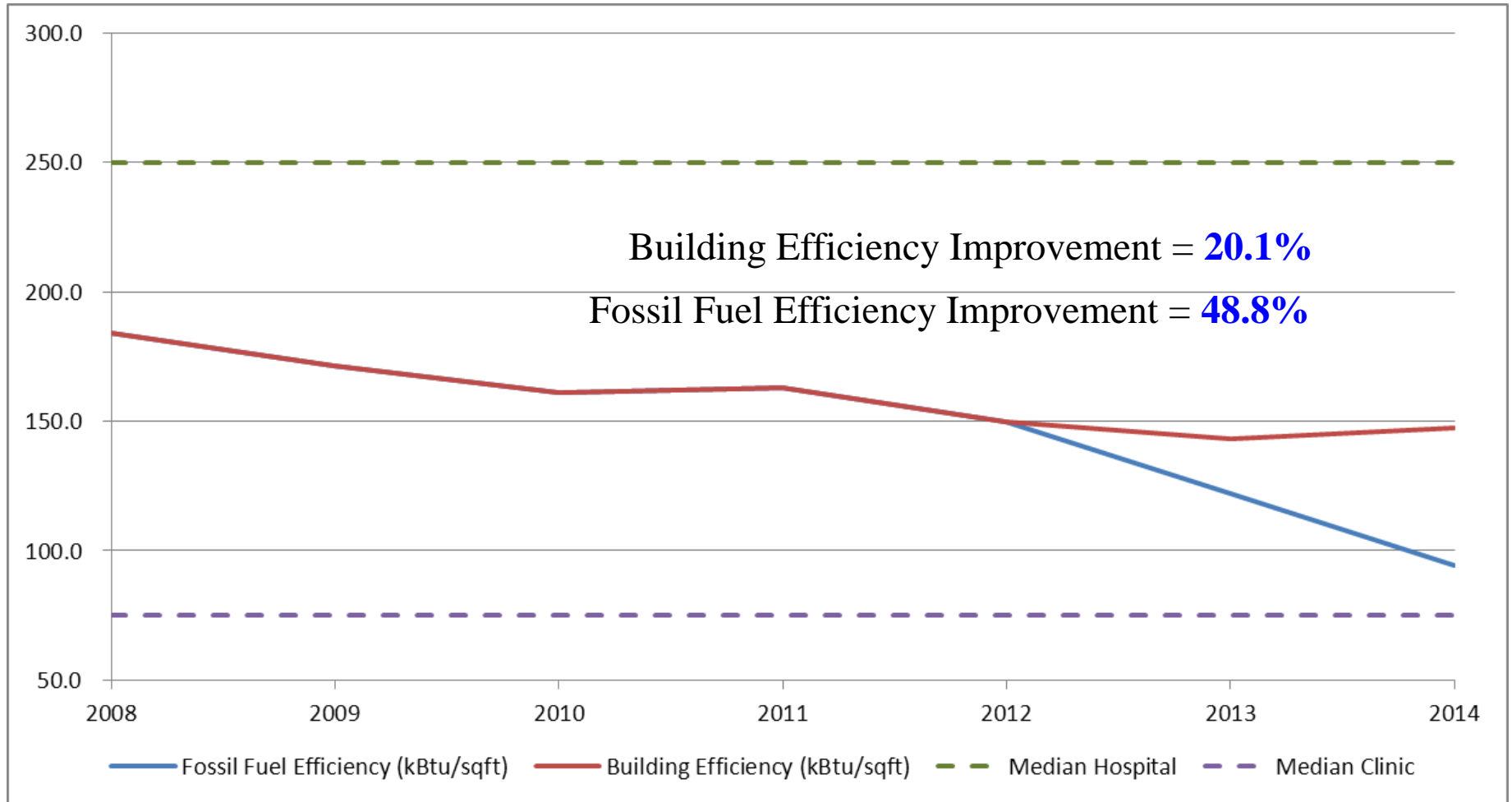


# Actual Energy Cost vs. “Business as Usual”



# Gundersen Energy Efficiency Trend

All Facilities Blended Energy Utilization Index (EUI)



# Emissions Impact

## Emissions<sup>(1,2,3)</sup> (lbs.)

	2008	2014	Reduction
Sulfur Oxides	230,133	105,542	-54%
Nitrogen Oxides	194,882	108,854	-44%
Carbon Dioxide	71,618,089	31,370,967	-56%
Mercury	2.10	1.05	-50%
Particulates	435,270	192,737	-56%

### Sources:

<sup>1</sup>Particulate conversion rate calculated from US EPA AP-42

<sup>2</sup>Air pollution from electricity-generating large combustion plants (pdf), Copenhagen: European Environment Agency (EEA), 2008, ISBN 978-92-9167-355-1

<sup>3</sup>U.S. Environmental Protection Agency Greenhouse Gas Equivalencies Calculator: <http://www.epa.gov/cleanenergy/energy-resources/refs.html>



# WASTE MANAGEMENT



# Comprehensive Waste Management

**Capital Investment = None**

**Annual Benefit = \$140K**

## Significant Projects

- Pharmaceutical / Hazardous Waste Reduction – 5 tons (40%) improvement
- Regulated Medical Waste Reduction – 14 tons (14%) improvement
- Pre-consumer Food Waste Reduction – 17 tons (70%) improvement



# Hazardous Pharmaceutical Waste Reduction

## Before



# 14:1



## After





# REUSE & RECYCLE



# Reuse & Recycling

**Capital Investment = None**  
**Annual Benefit = \$460K**

## Significant Projects

- Remanufactured devices (O.R. SUDs, O<sub>2</sub> Sensors, Toner Cartridges)
- Paper
- Cardboard / Plastics
- Reusable sharps containers
- Construction materials



# SUSTAINABLE DESIGN



# *Sustainable Design*

**Capital Investment = \$4.5M**

**Annual Benefit = \$650K**

## **Significant Projects**

- Geothermal heat pump
- Occupancy sensors and zone scheduling
- Heat recovery chillers
- Building envelope thermal integrity
- Desiccant wheel dehumidification in OR suite



# New Hospital Sustainable Design



433,000 Square Feet

Annual Energy Usage:

**115 kbtu/sqft**

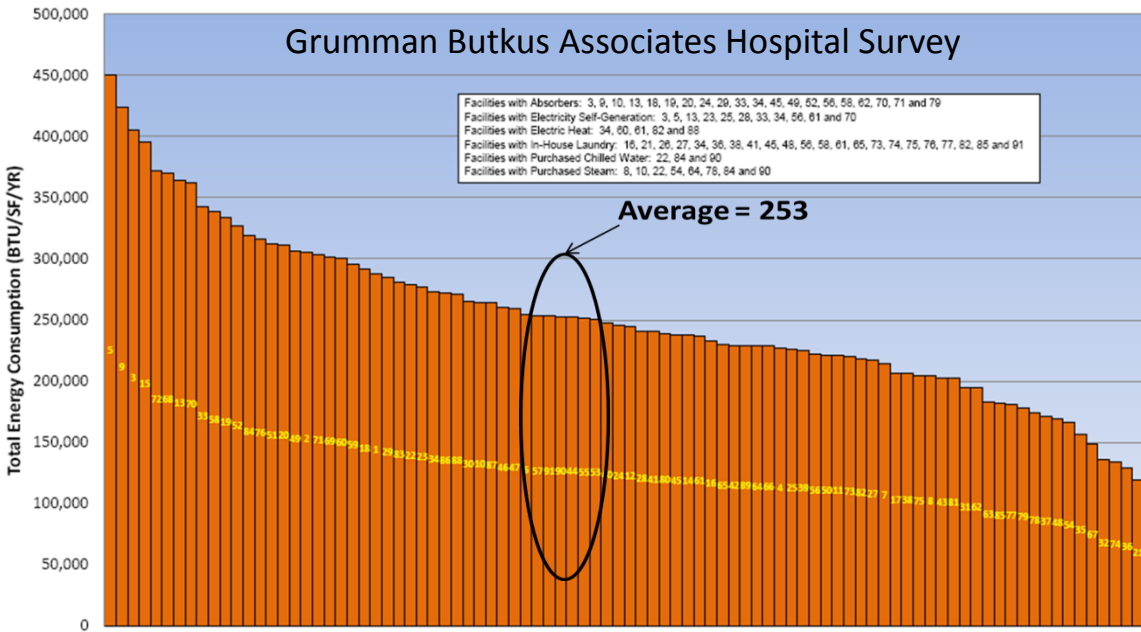
Estimated Annual Savings:

**\$650K at current energy rates**

Grumman Butkus Associates Hospital Survey

Facilities with Absorbers: 3, 9, 10, 13, 18, 19, 20, 24, 29, 33, 34, 45, 49, 52, 56, 58, 62, 70, 71 and 79  
 Facilities with Electricity Self-Generation: 3, 5, 13, 23, 25, 28, 33, 34, 56, 61 and 70  
 Facilities with Electric Heat: 34, 60, 61, 62 and 88  
 Facilities with In-House Laundry: 16, 21, 26, 27, 34, 36, 38, 41, 45, 46, 56, 58, 61, 65, 73, 74, 75, 76, 77, 82, 85 and 91  
 Facilities with Purchased Chilled Water: 22, 84 and 90  
 Facilities with Purchased Steam: 8, 10, 22, 54, 64, 76, 84 and 90

Average = 253



27/2007

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# Summary of Financial Benefits of the Energy & Sustainable Portfolio

- Financial Gains are a combination of:
  - Cost reductions
  - Selling energy back to the grid
  - Cost avoidance
- NPV in excess of \$2M
- IRR of 8%



# Envision<sup>®</sup>



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



# CFO Perspectives Website

<http://www.energyforhealthcare.org/>

**HEALTH CARE CFO PERSPECTIVES**  
Investment in Energy Efficiency



[Home](#) | [Case Studies](#)

## Health Care CFO Perspectives: Investment in Energy Efficiency

**A shared project of the U.S. Department of Energy and Practice Greenhealth**

At a time when health care organizations have many items competing for investment and shrinking budgets, Practice Greenhealth and the U.S. Department of Energy want to share numerous ways hospitals are cutting costs while contributing to a healthier environment through smart energy-related investments. This website is designed to serve as a forum for hospital CFOs to share energy related case studies and communicate with their colleagues relative to their energy efforts.

Please take this opportunity to learn, to teach and to communicate with your counterparts across the country! We hope that your organization will contribute your successes through this site! All participating organizations will be highlighted in a presentation at CleanMed 2015! We would love your comments on how to make this site more useful. [Contact us](#).

### Health Care Case Studies

**Building Energy Management Systems**

[Simches Research Building](#)

**Financing Mechanisms**

[University of Pittsburgh Medical Center](#)

**HVAC (Heating, Ventilation, and Air Conditioning)**

[Yawkey Center for Outpatient Care – Occupancy and Airflow](#)

[Gundersen Health Goes Deep for Green](#)





# Case Studies from CFO Perspectives page

- Gundersen Health System:
  - Installation of a Geothermal Heating and Cooling System in new Hospital Tower and Behavioral Health Building
- Massachusetts General Hospital:
  - Simches Research Building Occupancy Schedules, Minimum Airflow Reduction, Occupancy Sensors and Lighting Retrofits
  - Yawkey Center for Outpatient Care: Occupancy Schedules and Minimum Airflow Reduction
- University of Pittsburgh Medical Center
  - Energy Management/Conservation/Project Funding and Investment

Download the [case study template](#) and submit your case study to Bob Jarboe at [bjarboe@practicegreenhealth.org](mailto:bjarboe@practicegreenhealth.org)!



# Questions?

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