

# Energy Conservation: Challenges, Opportunities and Applications of the Healthier Hospital Initiative



Eric Buzzell, Vice President General Services  
Borgess Medical Center  
Kalamazoo, Michigan

**BORGESS**



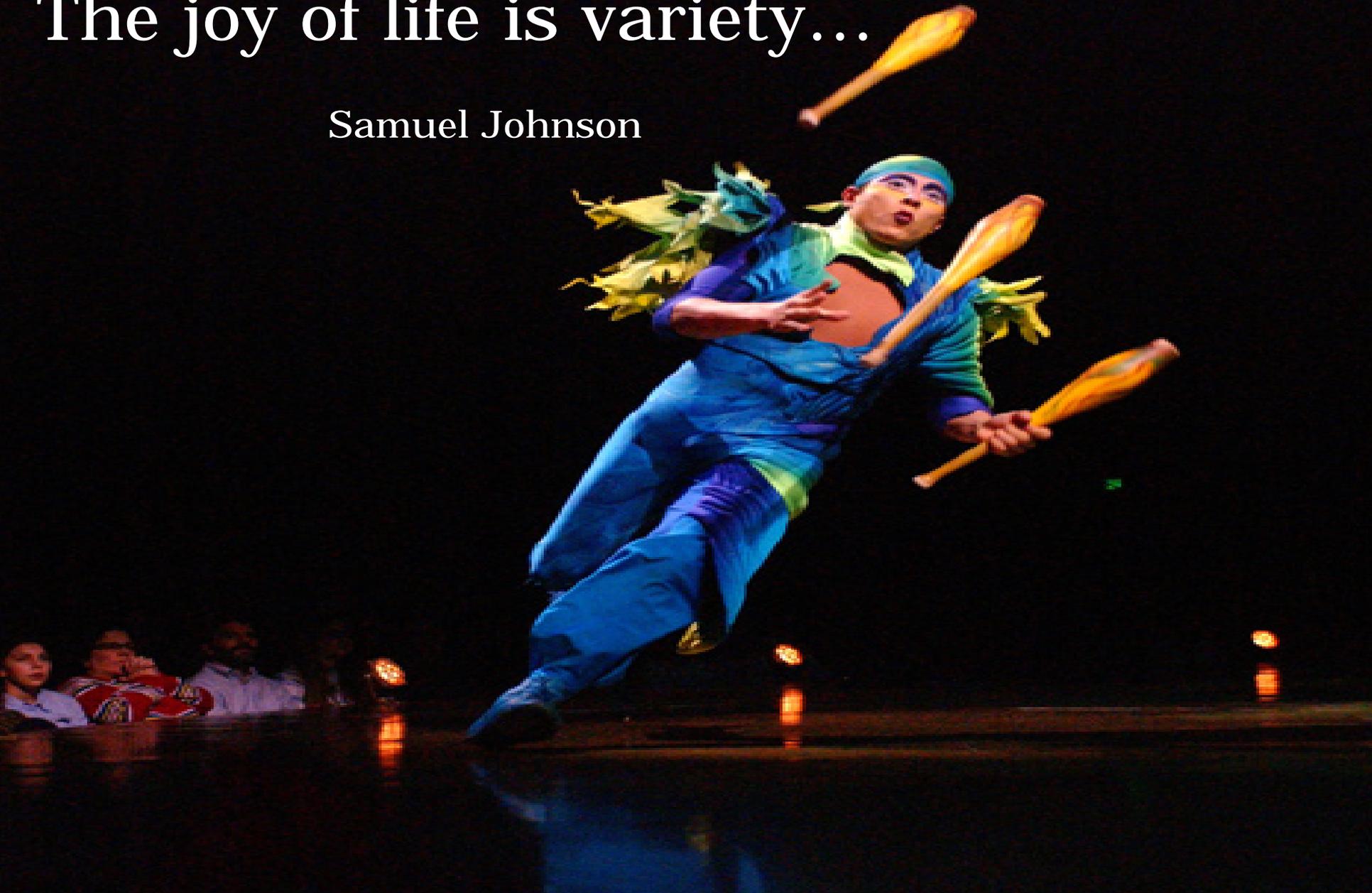
# Danger and delight grow on one stalk

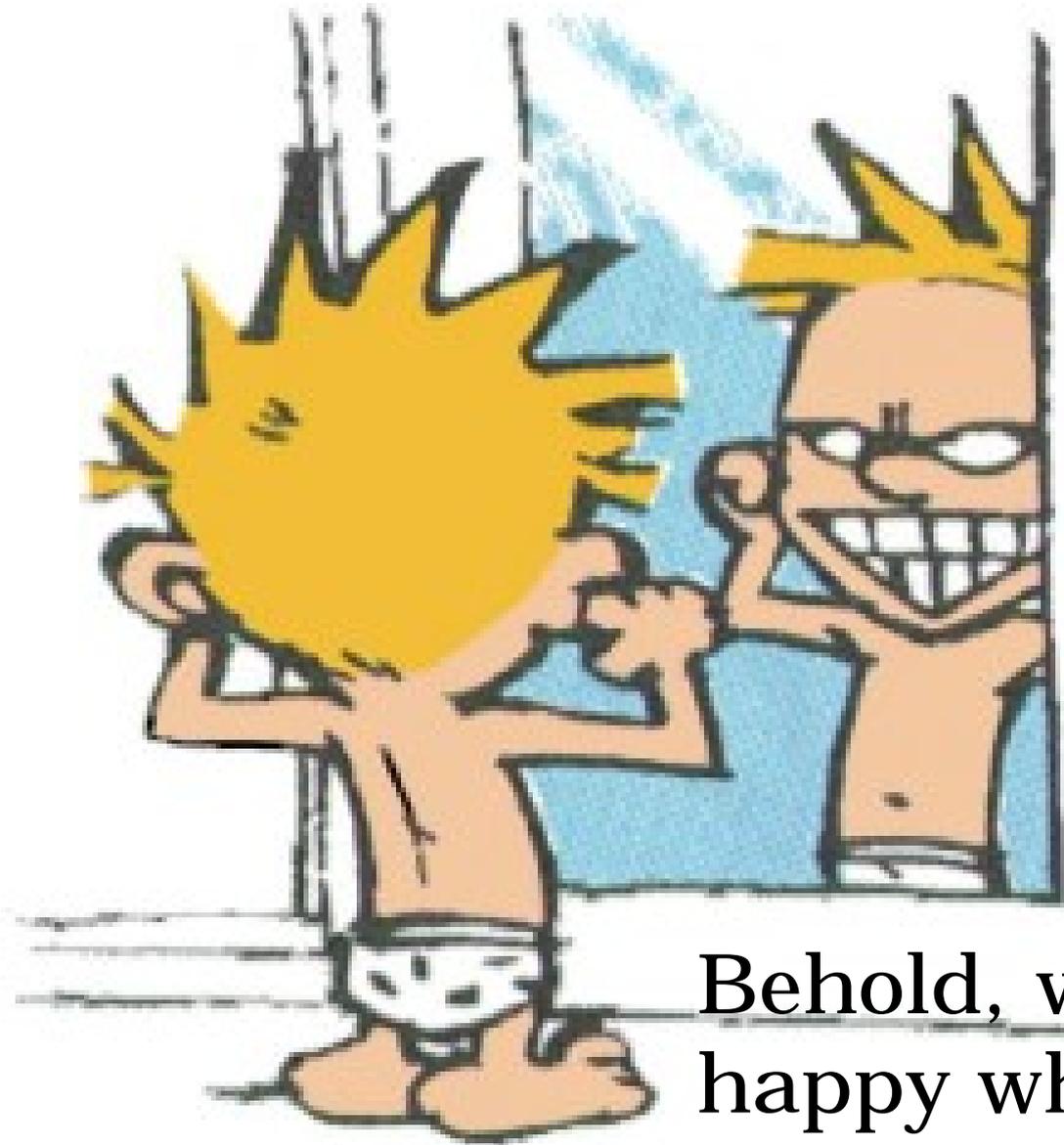
English proverb



The joy of life is variety...

Samuel Johnson





Behold, we count them  
happy which endure

James 5:3

Distant?





Is this your CFO?



Ok guys, we need 20% energy savings by the year 2020



ACA is upon us...



# Energy Savings Imperative



NAME: **Everett, Miss Betty Lou**  
 DATE: **11/10/50**

ARNOT-C

MEMORIAL HOSPITAL  
 PLAINFIELD, NEW YORK

Address: **RD#1, Pine City, NY**

**55745**

CASE NO.

ROOM: **303**  
 WARD: **303**

PERSON RESPONSIBLE: **Mutual of Omaha**  
 RATE \$: **9.00**

Office work at  
**Tomlinson, Travelers Agency**

MEMO	LINE	DATE	EXPLANATION	CHARGES	CREDITS	BALANCE
	1	NOV 11-50	SERVI-PRIV	* 9.00		
	2	NOV 11-50	DRUGS	* 0.20		
	3	NOV 11-50	LABORATORY	* 2.00		
	4	NOV 11-50	OPER-ROOM	* 10.00		
	5	NOV 11-50	NS	C* 0.15		
	6	NOV 11-50	NS	C* 0.15		
	7	NOV 11-50	CASH	* 1.00		
	8	NOV 11-50	DRUGS			
	9	NOV 13-50				
	10					
	11					
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23					
	24					

*Please return*

**RECEIVED**

DEC 1 1950

ART HOLTZMAN

ALL ACCOUNTS PAYABLE WEEKLY IN FULL.  
 SETTLEMENT OF ALL BILLS REQUIRED BEFORE LEAVING.  
 PHYSICIANS CHARGES NOT INCLUDED IN THIS BILL.

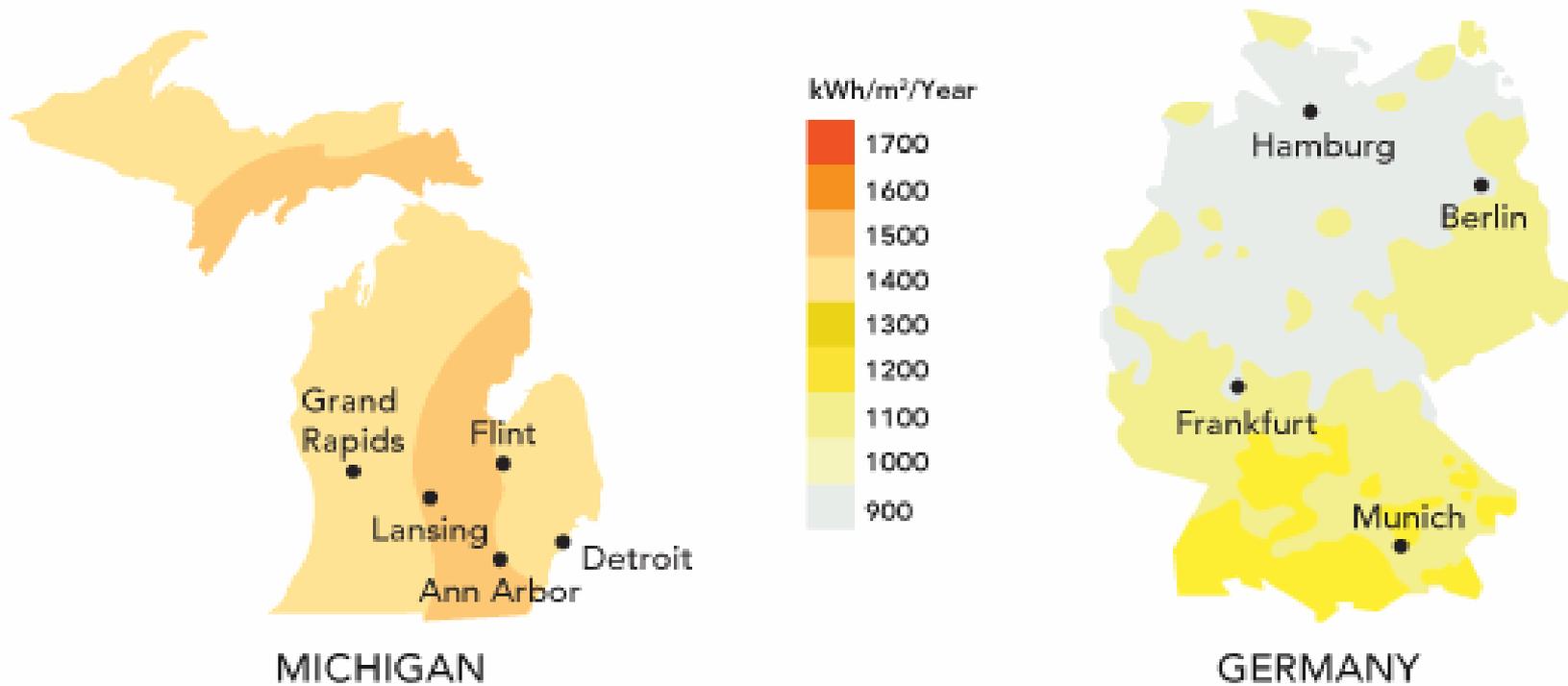
MISC. CHARGES  
 CODED ON REVERSE  
 SIDE OF BILL



# How



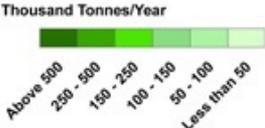
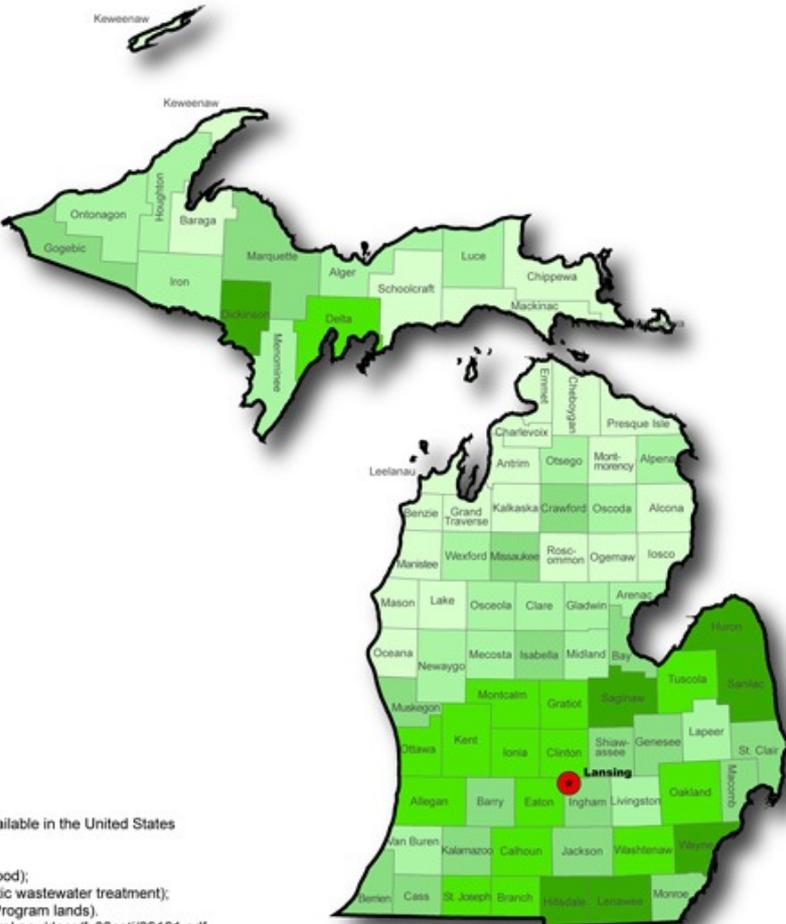
# Solar Power Potential in Michigan



Source: SUNY/Albany U.S. Model (1998-2005) & Joint Research Centre of the European Commission (1981-1990)

# Biomass Resources in Michigan

**Biomass Resources** **Michigan**



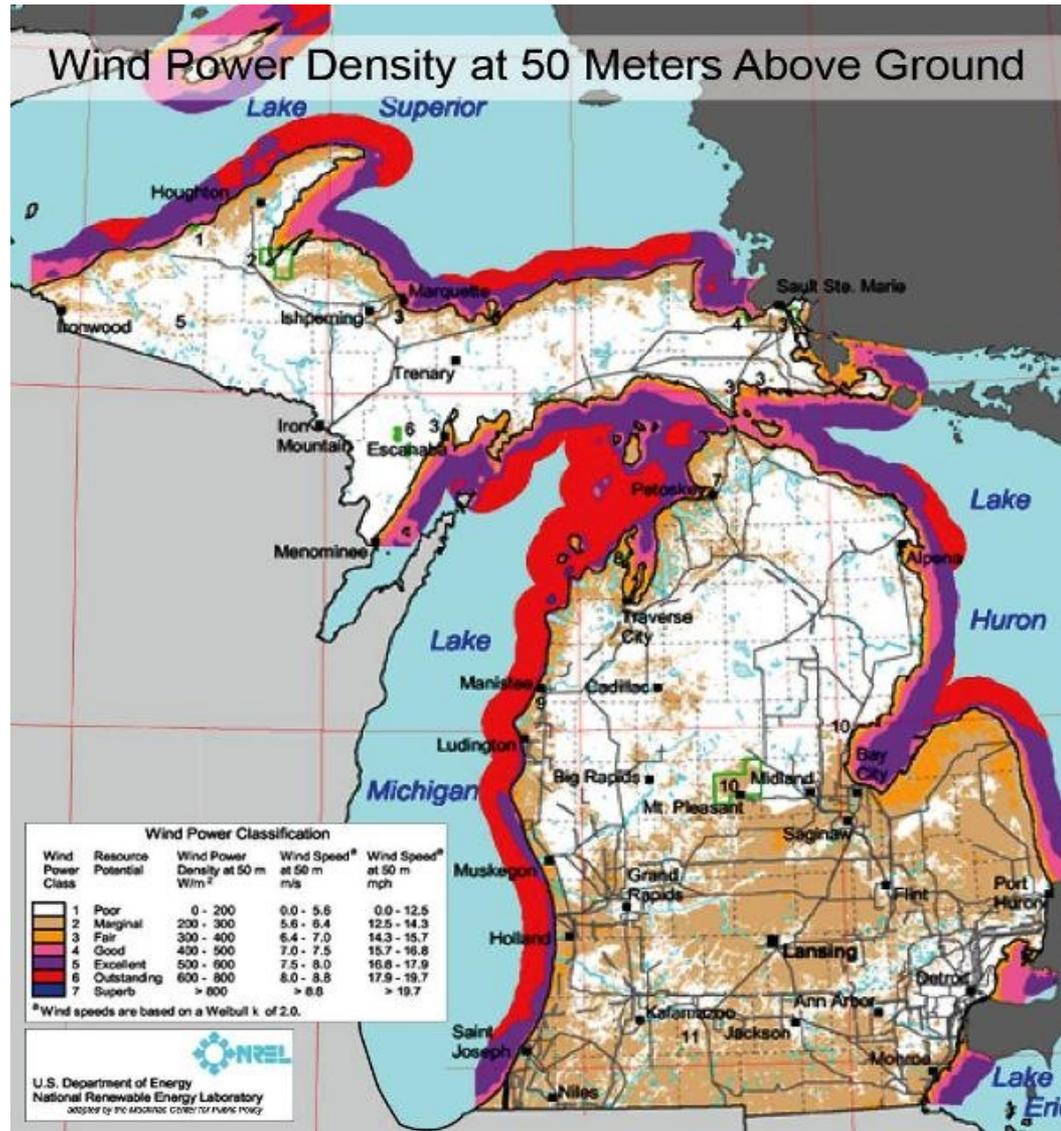
This study estimates the technical biomass resources currently available in the United States by county. It includes the following feedstock categories:

- Agricultural residues (crops and animal manure);
- Wood residues (forest, primary mill, secondary mill, and urban wood);
- Municipal discards (methane emissions from landfills and domestic wastewater treatment);
- Dedicated energy crops (switchgrass on Conservation Reserve Program lands).

See additional energy documentation for more information at <http://www.nrel.gov/docs/ty06osti/39181.pdf>



# Wind Power in Michigan



Pedal Power?

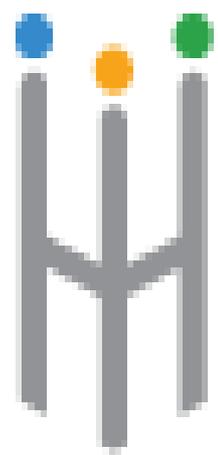


# Resources



PRACTICE  
**Greenhealth**<sup>TM</sup>  
MEMBER





# Healthier Hospitals INITIATIVE

Challenge: **Leaner Energy**



# HHI CHALLENGES

The HHI Challenges are a data-driven platform designed to help healthcare organizations commit to sustainability goals and track their environmental efforts.

**+ Engaged Leadership**

**+ Healthier Food**

**+ Leaner Energy**

**+ Less Waste**

**+ Safer Chemicals**

**+ Smarter Purchasing**

[VIEW FULL RESOURCE LIBRARY](#)

[VIEW DISCUSSIONS](#)

# Leaner Energy Challenge

**Baseline** Input energy data to ENERGY STAR® Portfolio Manager to establish baseline and track subsequent energy use and greenhouse gas emissions from metered energy use.

Level 1

Reduce greenhouse gases by decreasing weather-adjusted energy intensity from metered energy use by three percent from baseline.

Level 2

Reduce greenhouse gases by decreasing weather-adjusted energy intensity from metered energy use by five percent from baseline.

Level 3

Reduce greenhouse gases by decreasing weather-adjusted energy intensity from metered energy use by ten percent from baseline; OR, if facility is already an ENERGY STAR rated facility (> 75), maintain ES status.

Leaner Energy Measure Details			
Goal	Measure	Calculation Details	Guidance for Data Collection
Baseline: Input energy data to ENERGY STAR® Portfolio Manager to establish baseline and track subsequent energy use and greenhouse gas emissions from metered energy use.			
Reduce greenhouse gases by decreasing weather-adjusted energy intensity from metered energy use by three percent from baseline.	Site Energy Intensity	monthly energy usage (electricity & gas)	Energy Star Portfolio Manager, Refer to How To Guide.
		monthly energy cost (dollars)	
		squarefootage, number of floors, FTEs, staffed beds, number of buildings, number of MRI machines, max number of floors	
Reduce greenhouse gases by decreasing weather-adjusted energy intensity from metered energy use by five percent from baseline.	Site Energy Intensity	monthly energy usage (electricity & gas)	Energy Star Portfolio Manager, Refer to How To Guide.
		monthly energy cost (dollars)	
		squarefootage, number of floors, FTEs, staffed beds, number of buildings, number of MRI machines, max number of floors	
Reduce greenhouse gases by decreasing weather-adjusted energy intensity from metered energy use by ten percent from baseline; OR, if facility is already an ENERGY STAR rated facility (> 75), maintain ES status.	Site Energy Intensity	monthly energy usage (electricity & gas)	Energy Star Portfolio Manager, Refer to How To Guide.
		monthly energy cost (dollars)	
		squarefootage, number of floors, FTEs, staffed beds, number of buildings, number of MRI machines, max number of floors	



ENERGY STAR

**MyPortfolio**

Sharing

Planning

Reporting

Recognition

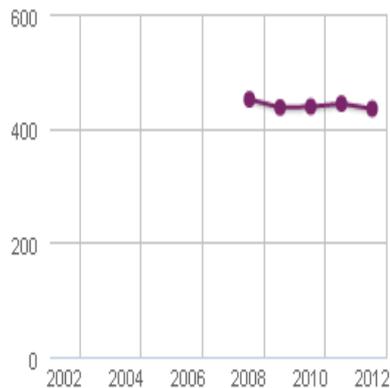
**Properties (2)**

[Add a Property](#)

**Notifications (0)**

You have no new notifications.

**Source EUI Trend (kBtu/ft<sup>2</sup>)**



**My Properties (2)**

[Add a Property](#)

Filter by:

[Search](#)

[Create Group](#) | [Manage Groups](#)

Name	Action
<a href="#">Borgess Medical Center</a>	<input type="text" value="I want to..."/>
<a href="#">Borgess-Lee Memorial Hospital</a>	<input type="text" value="I want to..."/>

[Download Entire Portfolio](#)

**Total GHG Emissions Trend (MtCO<sub>2</sub>e)**



**i** If you're a pro, you may want to [upload and/or update multiple properties](#) at once using an Excel spreadsheet. This can be done to create new properties, add use details, create meters and add meter consumption data.

# Borgess Medical Center

1521 Gull Road, Kalamazoo, MI 49048 | [Map It](#)

Portfolio Manager Property ID: 1460850 | Primarily: [Hospital \(General Medical & Surgical\)](#)

Year Built: 1974

ENERGY STAR Score (1-100)

Current Score: 38

Baseline Score: 35

## Summary

## Details

## Meters

## Goals

## Design

### Property Profile

You haven't created a profile for your property yet. Profiles are a way to supplement the information in Portfolio Manager with additional information about your property, including a photo.

[+ Create Profile](#)

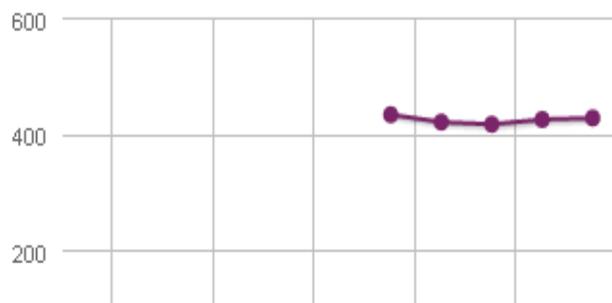
### Notifications

You have no new notifications.

### Individual Buildings on this Property (0)

[Add a Building](#)

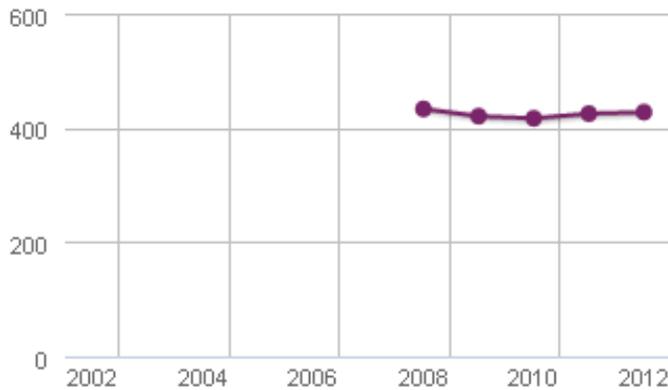
### Source EUI Trend (kBtu/ft<sup>2</sup>)



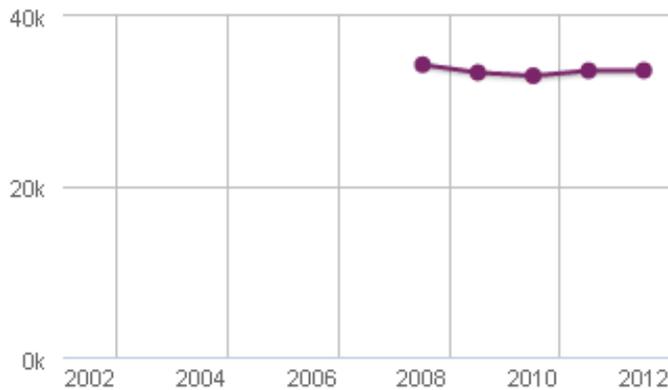
### More About Individual Buildings

This property is a multi-building property, and you haven't added any individual buildings. This is optional. You don't have to add individual buildings unless you would like to track performance separately. This will only be possible if you have your buildings metered individually. Also keep in mind that if you enter individual buildings, you will still need to keep use and meter information about the property as a whole up to date in order to receive accurate metrics about your property (and, in some cases, to apply for the ENERGY STAR). [Learn more about tracking multi-building properties.](#)

### Source EUI Trend (kBtu/ft<sup>2</sup>)



### Total GHG Emissions Trend (MtCO<sub>2</sub>e)



### More About Individual Buildings

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### Sharing this Property

Shared with: 4 [Contacts](#)

[Share](#)

Name	Permissions	Action
<a href="#">Scher, Dan</a>	Full Access	I want to... <input type="button" value="v"/>
<a href="#">Pierce, Anna</a>	Custom Access	I want to... <input type="button" value="v"/>
<a href="#">BBC Account, Ascension</a>	Read Only	I want to... <input type="button" value="v"/>
<a href="#">HHI, Campaign</a>	Read Only	I want to... <input type="button" value="v"/>

[Edit Multiple Permissions](#)

[Download Property to Excel](#)

# Borgess Medical Center

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Year Built: 1974

ENERGY STAR Score (1-100)

Current Score: 38

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Summary

Details

Meters

Goals

Design

## Basic Information

[View/Edit all Details](#)

### Construction Status:

Existing

### Federal Property:

No

### Find A Service & Product Provider (SPP):

Empty

 Editing basic information also includes name, address, etc.

## This Property's Overall Use

 [View as Diagram](#)

Add Another Type of Use

Add

Name	Primary Function	Gross Floor Area	Action
▶ Hospital	<a href="#">Hospital (General Medical &amp; Surgical)</a>	1117000 ft <sup>2</sup>	I want to... 
▶ parking structure	<a href="#">Parking</a>		I want to... 
▶ Lab/NeuroInstitute/ETC	<a href="#">Outpatient Rehabilitation/Physical Therapy</a>	112000 ft <sup>2</sup>	I want to... 

# Borgess Medical Center

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Year Built: 1974

**ENERGY STAR Score (1-100)**

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**Meters**

Goals

Design

## Energy & Water Consumption

[Manage/Enter My Bills](#)

## Meters for Performance Metrics

[View/Edit Configuration](#)

## Utility & Weather

**Electric Distribution Utility (EDU):**  
Consumers Energy Co [CMS Energy Corp]

## Energy Meters (2)

[View as a Diagram](#)

[Add Another Meter](#)

Name	Energy Type	Most Recent Bill Date	Action
<a href="#">Natural Gas</a>	Natural Gas	06/30/2013	I want to... <input type="button" value="v"/>
<a href="#">Electric Power</a>	Electric - Grid	06/30/2013	I want to... <input type="button" value="v"/>

## Water Meters (2)

[View as a Diagram](#)

[Add Another Meter](#)

Name	Water Meter	Most Recent Bill Date	Action
------	-------------	-----------------------	--------



## Manage Bills (Meter Entries) for [Borgess Medical Center](#)

You may select one of your meters to get started. Or, if you are coming here from your meter list, a meter may already be selected.

Tell us which meter you would like to enter or manage bill information for:





Don't see the meter you are looking for? [Add another meter](#)

<input type="checkbox"/>	Start Date	End Date	Usage	Cost	Estimation	Green Power
<input type="checkbox"/>	5/1/2007	5/31/2007	3036800 kWh (thousand Watt-hours)	206902.14	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	6/1/2007	6/30/2007	3244800 kWh (thousand Watt-hours)	221299.03	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	7/1/2007	7/31/2007	3369600 kWh (thousand Watt-hours)	225771.41	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	8/1/2007	8/31/2007	3574400 kWh (thousand Watt-hours)	239519.23	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	9/1/2007	9/30/2007	3113600 kWh (thousand Watt-hours)	211269.68	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	10/1/2007	10/31/2007	2905600 kWh (thousand Watt-hours)	198708.44	<input type="checkbox"/>	<input type="checkbox"/>



More than 1,400 healthcare locations in 21 states.

Five Michigan healthcare ministries in:

- Detroit
- Flint
- Saginaw
- Tawas City
- Kalamazoo



# Program Vision



The Environmental Stewardship Program challenges us to act as stewards of God's creation and operate at our full potential by identifying and implementing practical solutions to minimize the organization's impact on the natural environment and the communities we serve.



# The SUSTAINABLE HEALTHCARE

Mission

Patients • Planet • Profit

dell children's

medical center of central texas

A member of the  Texas Family of Hospitals



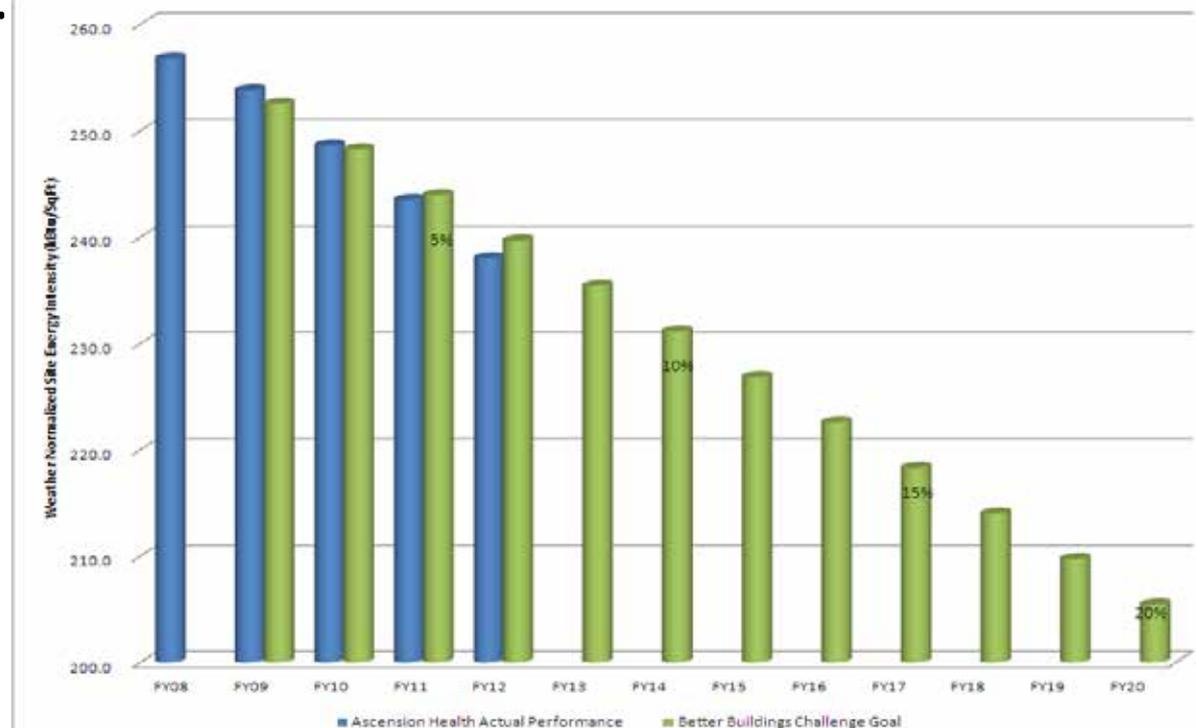
Columbia St. Mary's  
Milwaukee, WI  
18,000 sf Living Roof



# Energy Use Reduction



Ascension Health achieved a 7.1% reduction in energy use and \$18.8 million in cost avoidance across 35 million square feet of buildings from FY08 to FY12.



# Facility Infrastructure Pool



§ Capital allocation fund that does not compete with clinical needs



# Education & Behavior Changes



- § Equipment optimization
- § Inspect equipment regularly



# Education & Behavior Changes



- § Implement easy control strategies
- § Limit access to system changes



Once  
Upon  
a  
time  
1889



Gas lights

Kerosene lamp

THE PARLOR, BORGESS HOSPITAL, KALAMAZOO, MICH.

# **BORGESS** HEALTH



**1521 Gull Road  
Kalamazoo, Michigan**

# Sustainable Leadership



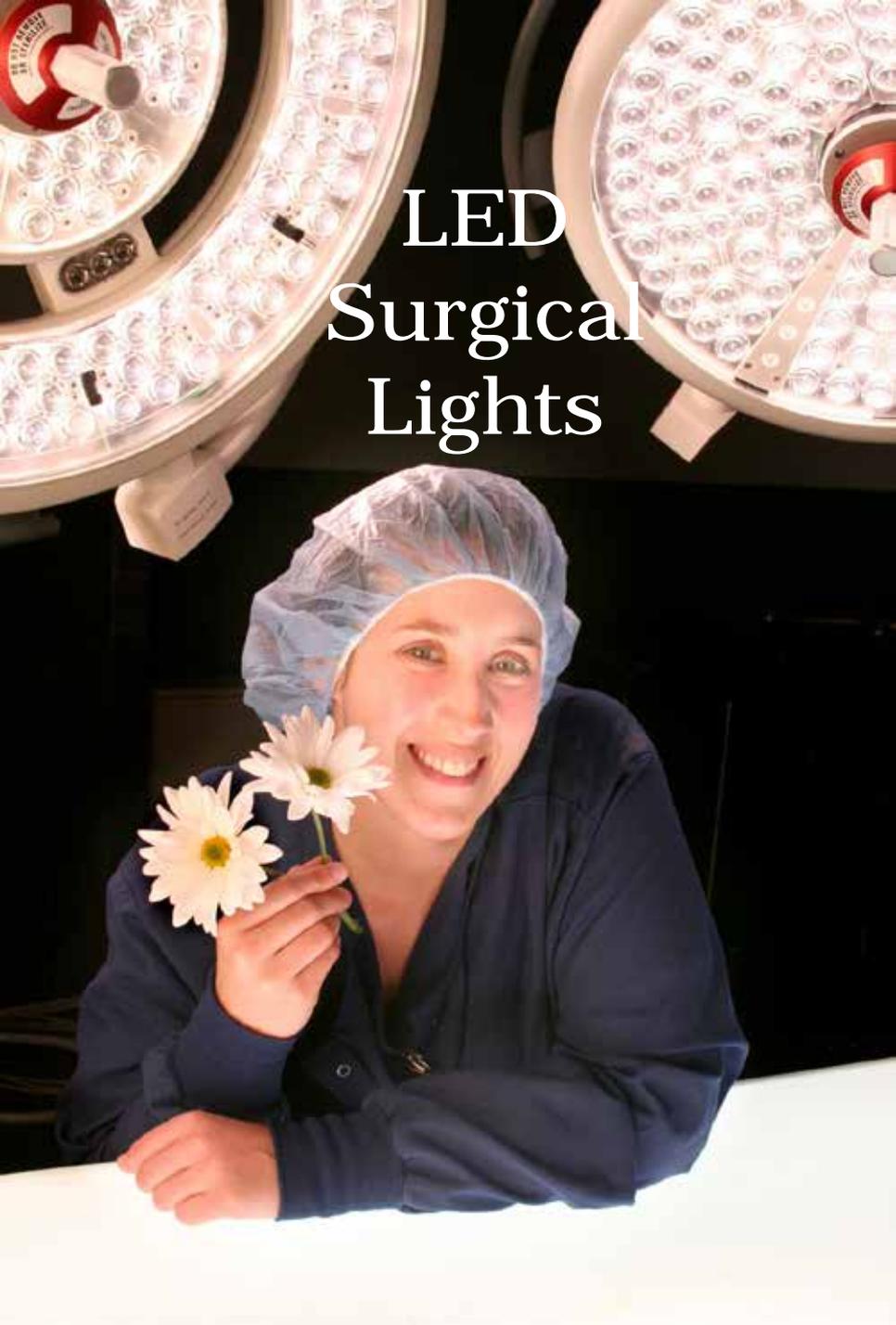
That's where:  
sustainable leadership  
influenced sustainable  
behavior

# Energy Conservation

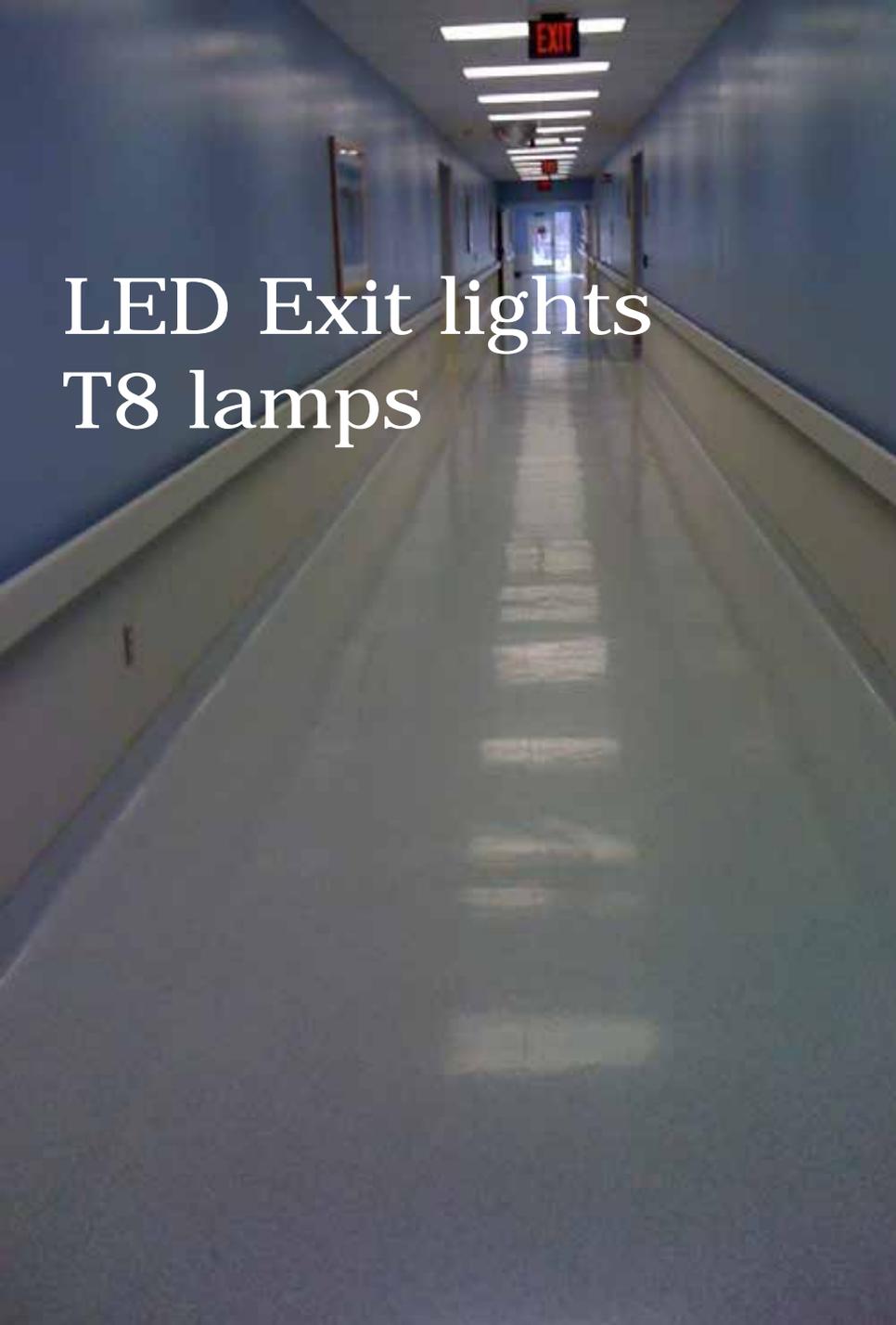
## Lighting conversions

- From T12 to T8 lamps
- From incandescent to CFL & LED
- Occupancy sensor lighting controls





LED  
Surgical  
Lights



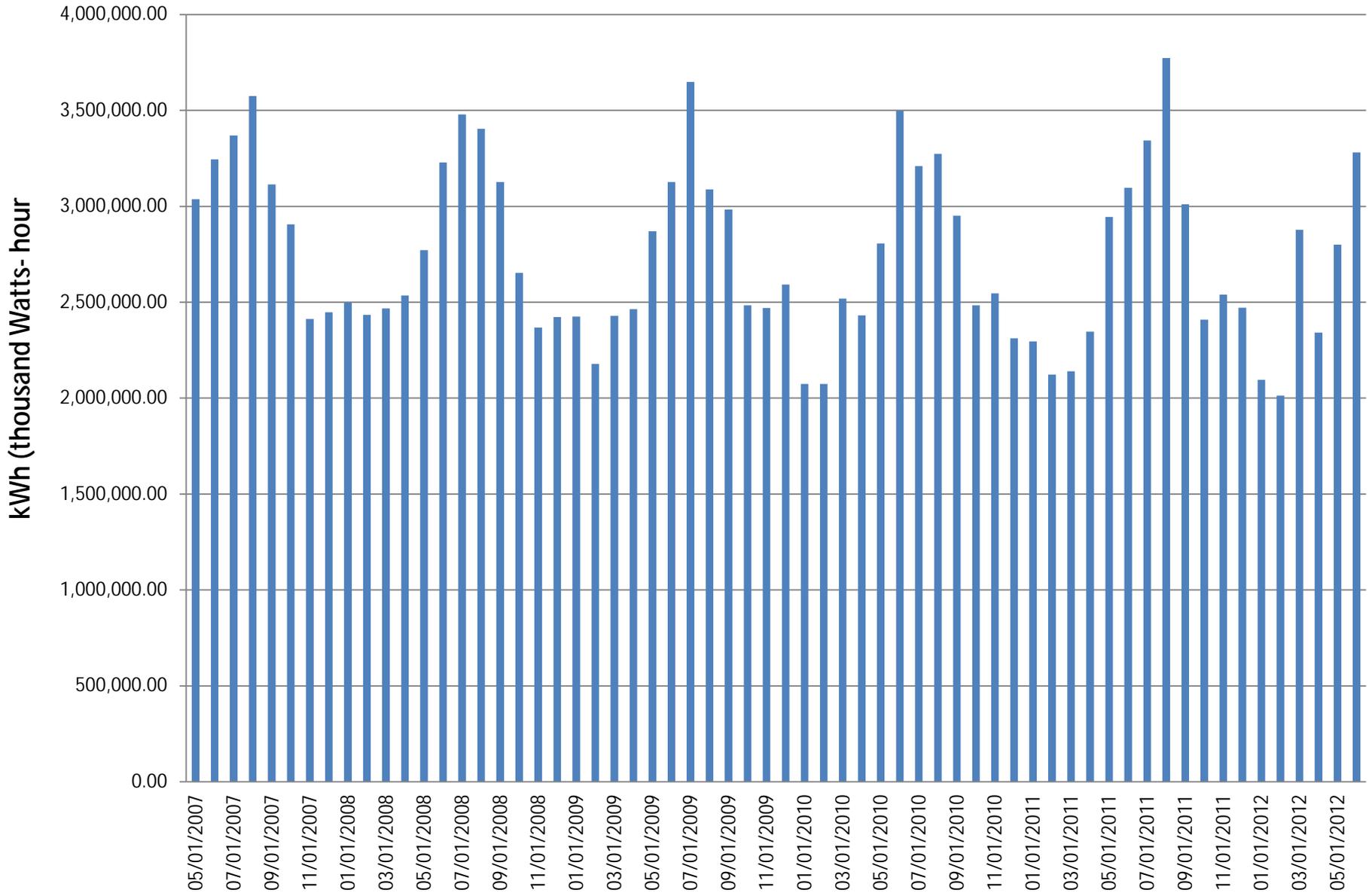
LED Exit lights  
T8 lamps

# Energy Management

- Boiler controls
- Steam Trap Maintenance
- Variable Frequency Drives
- Energy Efficient Motors
- Enthalpy controls
- Chilled water Temperature control

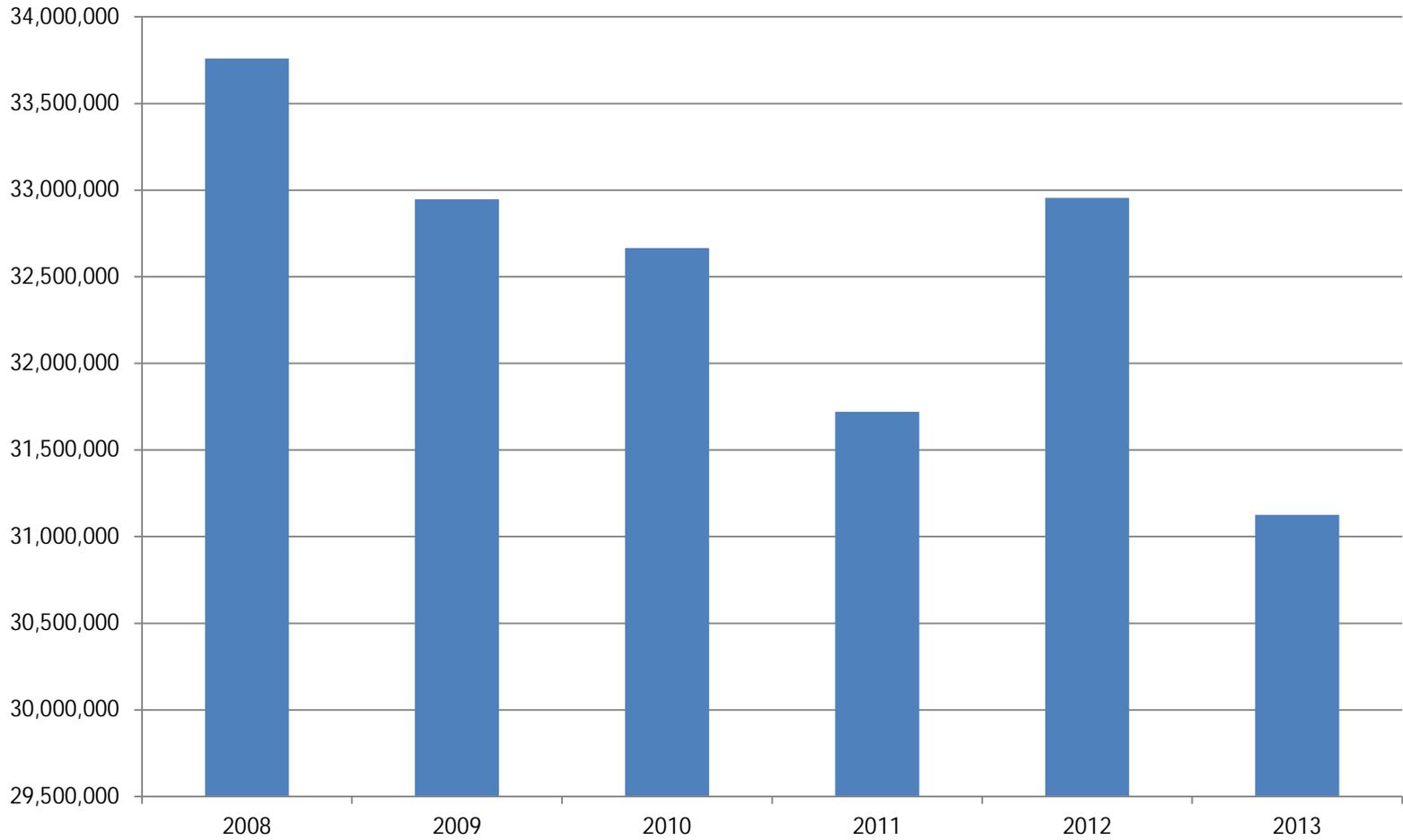


# Borgess Medical Center Electricity Use

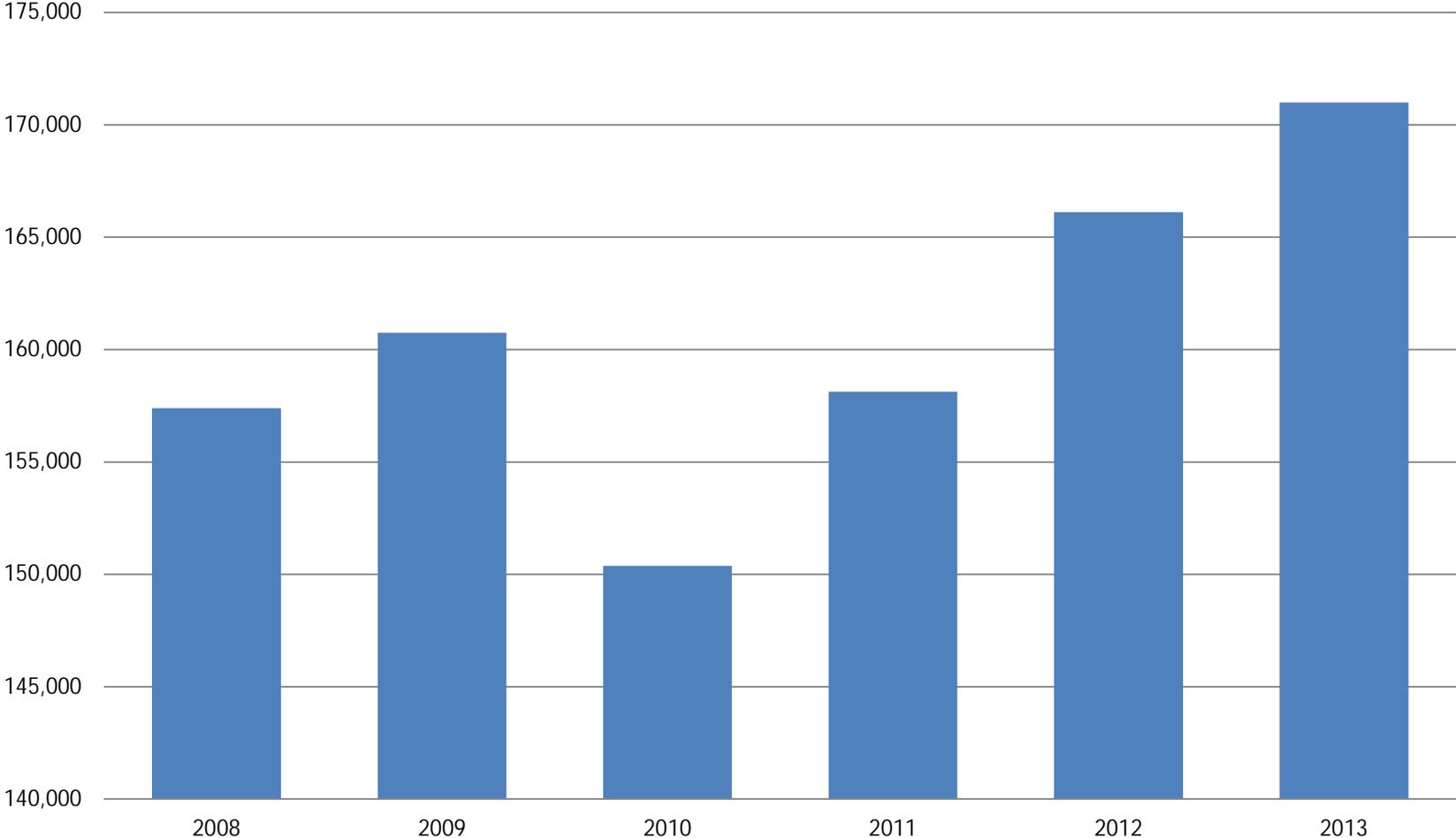


May 2007 to May 2012

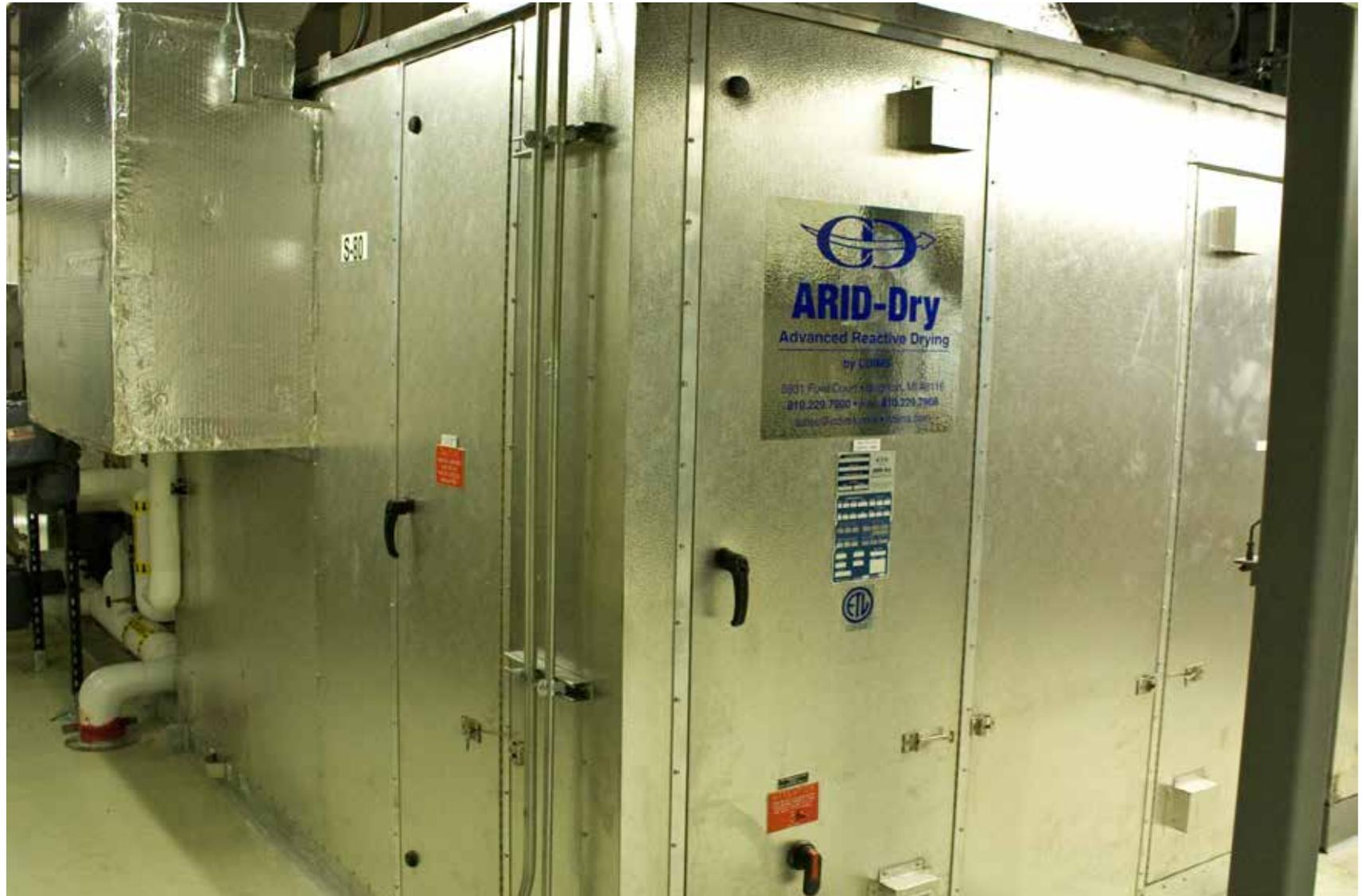
## Borgess Medical Center Electricity Usage kwh



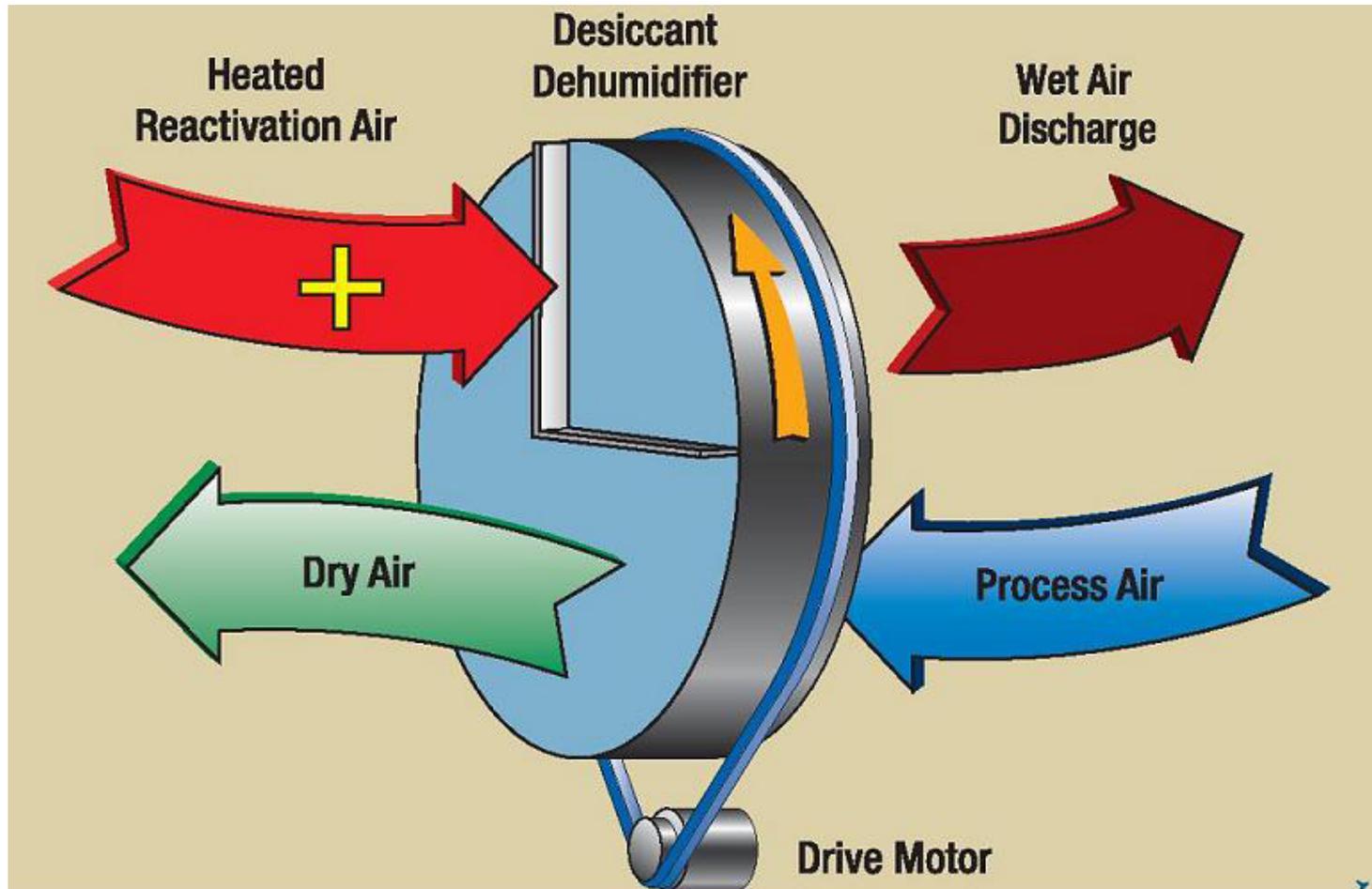
# Borgess Medical Center Natural Gas Usage kcf



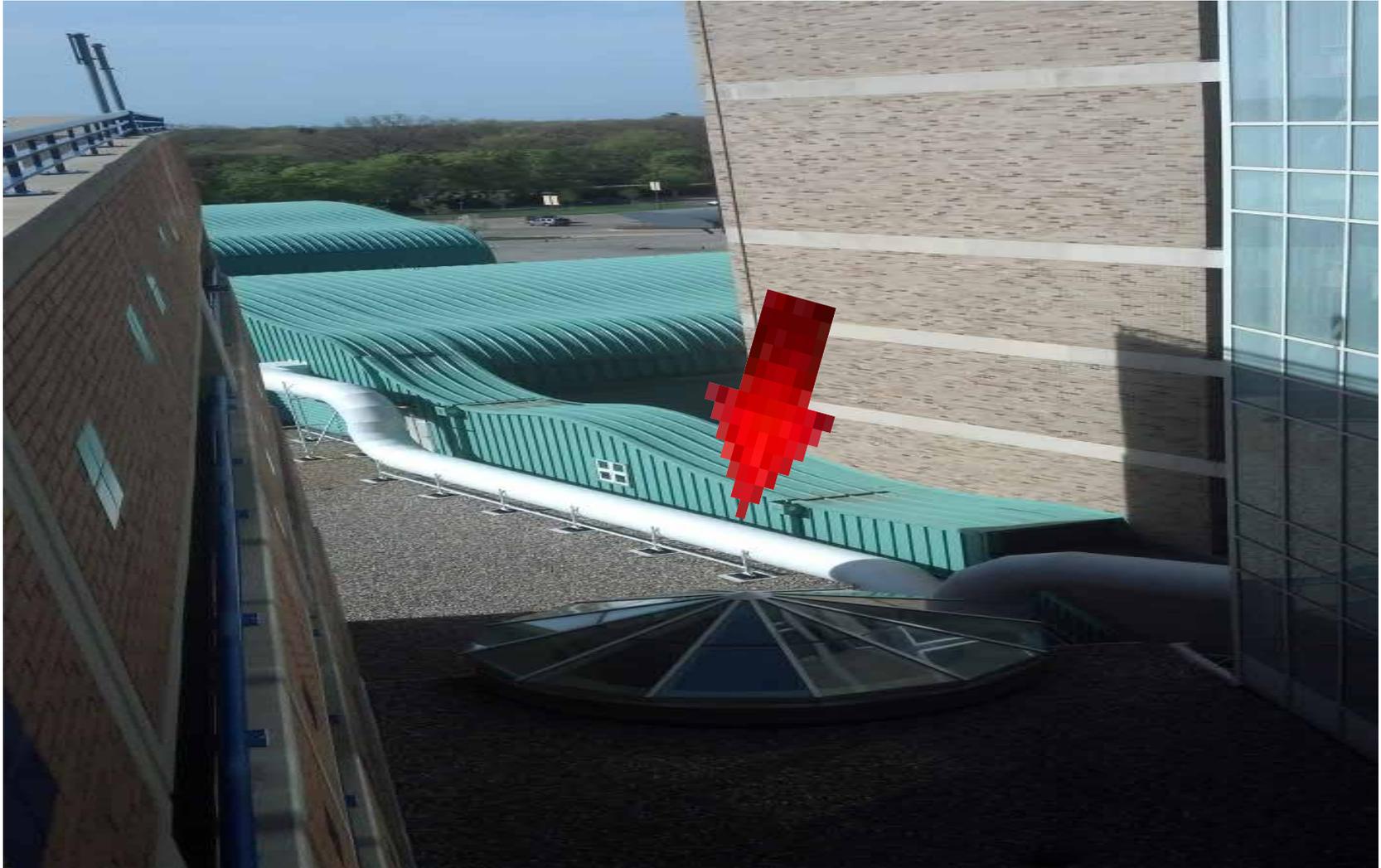
# Desiccant Dehumidification



# How a Desiccant Wheel Works



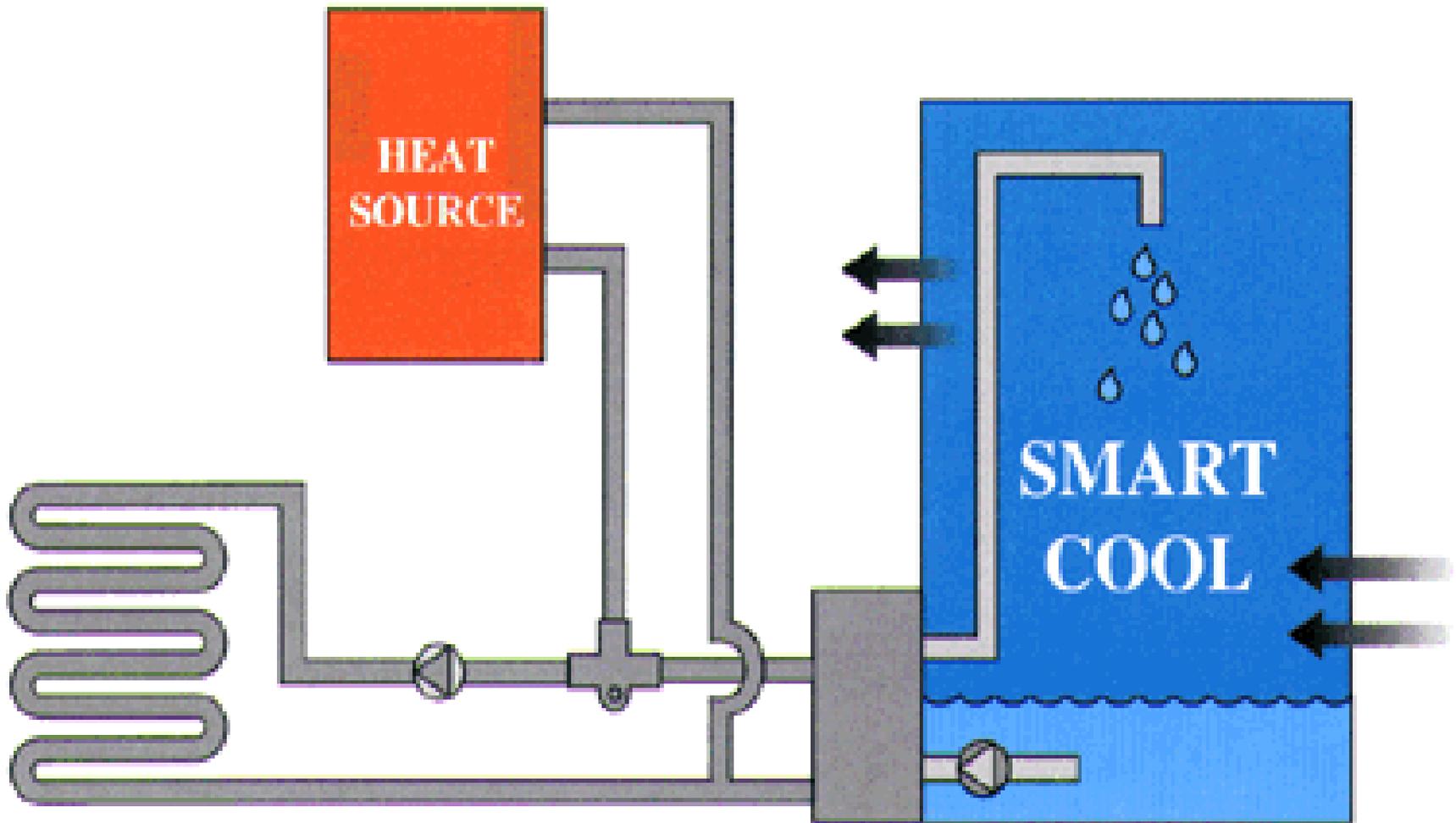
# The New Ductwork From Desiccant Wheel To Surgery Air Handler



# Hydronic Cooling



This is how a hydronic cooling system works:



New Battle Creek Ambulatory Center  
LEED Silver Equivalent  
100% LED lighting



Borgess Healing Garden:  
Converting sunlight  
to deliciousness.



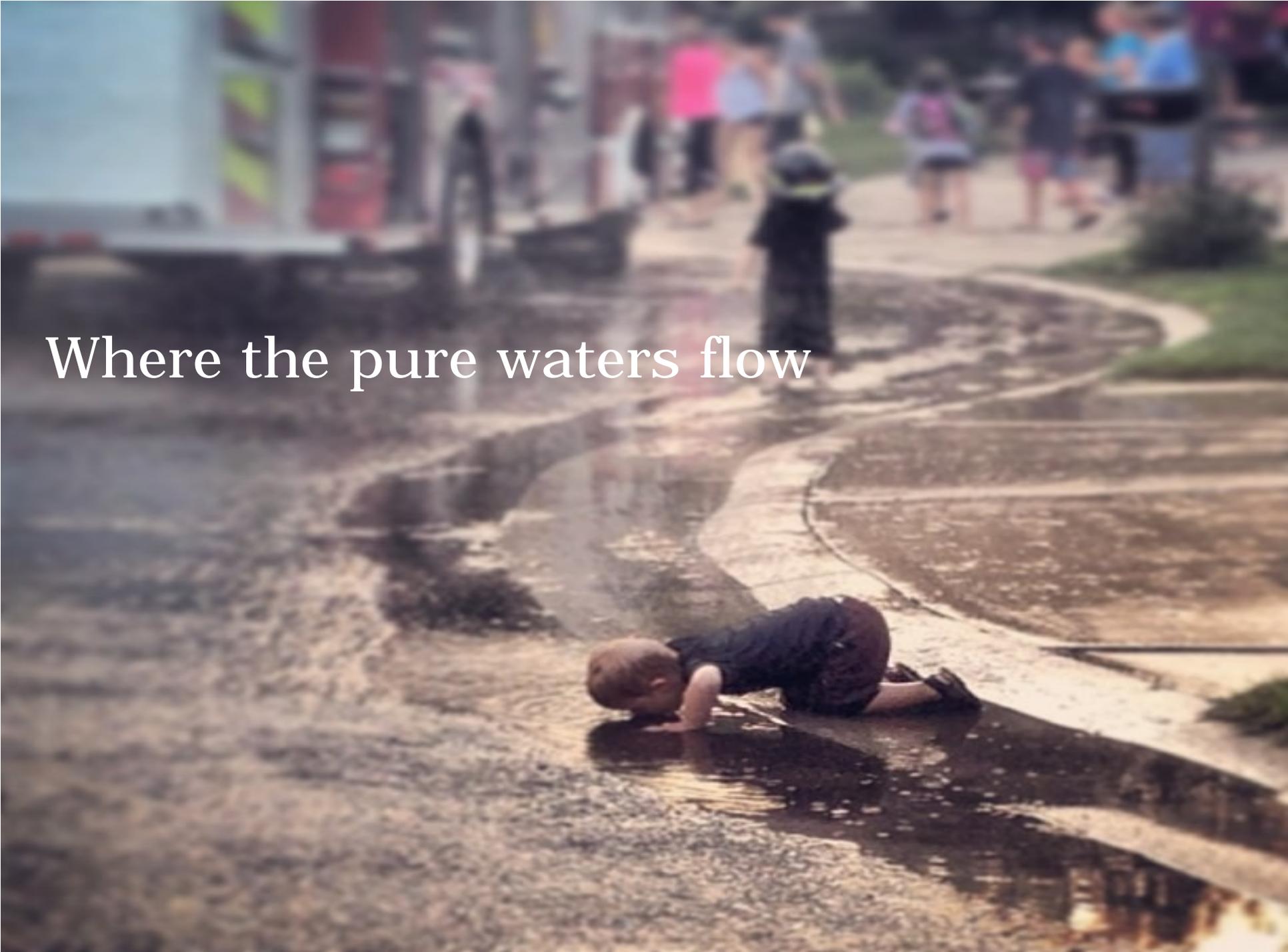
# Healthier Michigan Hospitals

A satellite-style map of Michigan and the surrounding Great Lakes region. The land is shown in shades of green, and the water bodies (Superior, Michigan, Huron, Erie, and St. Clair) are highlighted in a dark blue color. The text "Healthier Michigan Hospitals" is overlaid in white, sans-serif font in the upper right quadrant.

For the places we love...



Where the pure waters flow



Thank you

