



# ***LEED*ing the Way with Practical, Sustainable Design**

**Athletic Business**  
TOGETHER. DEFINING WHAT'S NEXT  
**CONFERENCE  
& EXPO 2013**

**Hastings+Chivetta**  
ARCHITECTURE • PLANNING • ENGINEERING



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# Presentation Objectives

- **Articulate a confident base line strategy in how to approach LEED for your project.**
- **Learn what sustainable designs have worked and have not worked in some recreation facilities.**
- **Understand the real cost of LEED and the incremental increase for each LEED level.**



# Presentation Outline

## I. Introduction

- Sustainability
- How Big Is It?

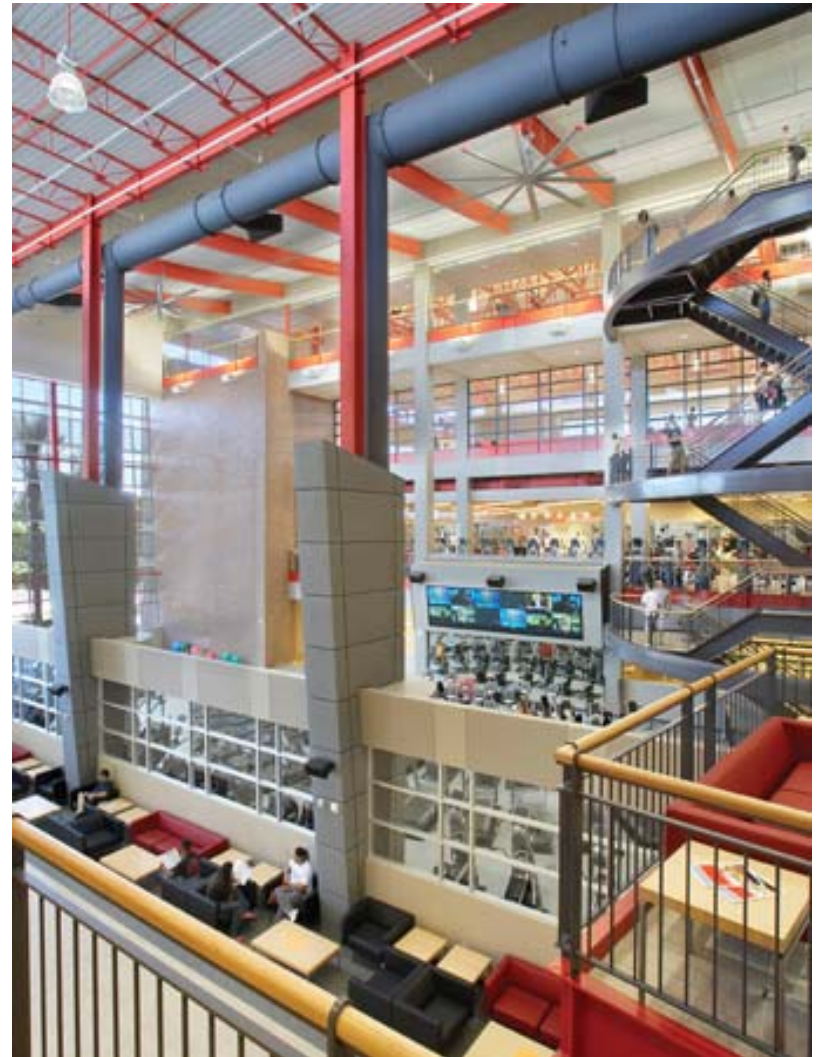
## II. What is LEED

- History
- Process
- Rating System

## III. Examples

## IV. Cost

## V. Discussion



# I. INTRODUCTION

INTRODUCTION

WHAT IS LEED

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# U.S. Construction Statistics

- **Design Phase** **\$1,812,428,245,174**
- **Bid Phase** **\$26,343,167,616**
- **Construction Phase** **\$3,747,749,140,139**
- **Recreation Projects** **\$3,967,554,422**

Type	Average Budget	Average Area	Number of Projects
New Construction	\$26,124,513	114,254 SF	96
<b>Expansion</b>	<b>\$19,125,412</b>	<b>61,343 SF</b>	<b>61</b>
<b>Renovation</b>	<b>\$14,138,380</b>	<b>81,785 SF</b>	<b>62</b>
<b>Average</b>	<b>\$20,772,536</b>	<b>89,061 SF</b>	<b>219</b>

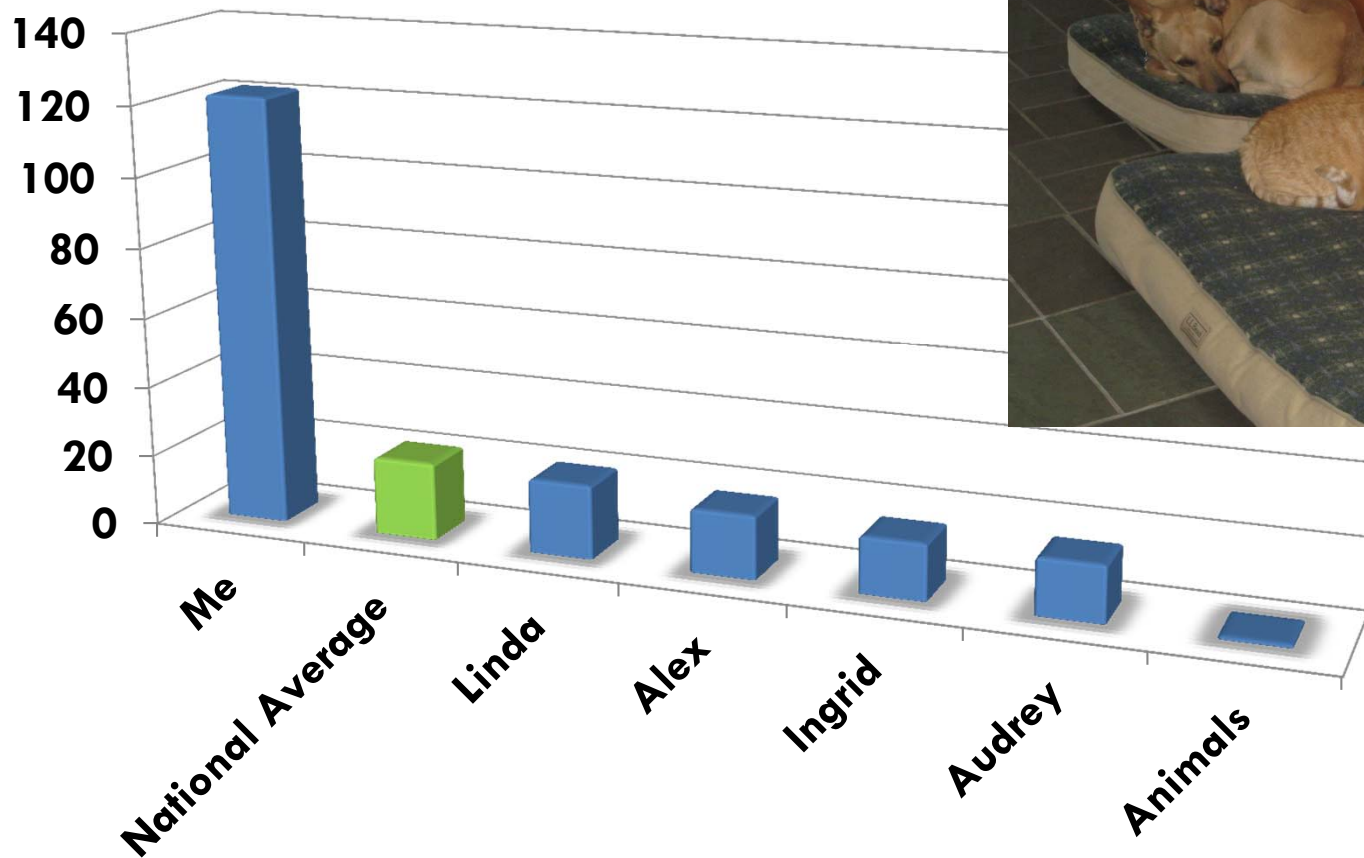
Source: REED Construction Data, Inc.  
NIRSA

# LEED, Vegas & Gaming

- **2006 USGBC gave a waiver to Vegas to allow smoking in casinos**
- **Considered casinos and support facilities separate (hotel tower, shopping mall separate for casino)**
- **Biggest tax breaks by city in the nation - \$138M**
- **USGBC member sponsor**
- **5 casinos participate**



# Me & My Family – CO2 Emissions



**National Average - 22 Tons of CO2/Year**



# About Me

- **Product of the 1973 Energy Crisis**
- **Working since 15 for Architects**
- **Suburban Sustainable**
  - Recycle
  - Garden
  - Compost
- **LEED AP 2002**



# Athletic/Recreation/Municipal Projects

- **\$2.5 Billion Dollars of Recreation & Athletic Work**
- **15 Million+ Square Feet**
- **169 Projects**
- **84 Renovation/Addition Projects**
- **NIRSA – 18 Awards**
- **Athletic Business – 18 Facility of Merit Awards**
- **Recreation Management – 4 Awards**
- **AIA – 7 Awards**
- **100% Professional Staff is LEED AP**

# LEED Experience



- WILLIAM & MARY
- SIUE ENGINEERING
- JOHN BROWN UNIV



- CENTRE COLLEGE  
CAMPUS CTR.
- GEORGIA SOUTHERN
- VCU CAMPUS CTR.
- SIUE SCIENCE
- SIUE SCIENCE  
RENOVATION
- SALVATION ARMY  
COMM. CENTER
- UNIV. OF DAYTON
- TEMPLE UNIV.
- DENISON UNIV.



- CENTRE COLLEGE PEARL
- CENTRE COLLEGE SCIENCE
- CENTRE COLLEGE  
BROCKMAN COMMONS
- LONGWOOD UNIVERSITY
- MOREHEAD STATE
- COLORADO STATE
- VCU CARY STREET



- BERIA COLLEGE

**37 LEED Equivalent Projects**  
**11 LEED Design/Pending**

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# LEED Approach

## IMMEDIATE PAYBACK

- ORIENTATION
- BUILDING MASSING
- WINDOW POSITION
- EFFICIENT SITE USAGE

No Cost



INTRODUCTION

- GLAZING AREA AND PERFORMANCE
- DAYLIGHT CONTROLS
- SOLAR SHADING
- NIGHTTIME VENTILATION
- MIXED MODE VENTILATION
- REFLECTIVE ROOFS

Low Cost



WHAT IS LEED

- HEAT RECOVERY
- DESICCANT COOLING
- EVAPORATIVE COOLING
- WIND TOWERS/SCOOPS
- GREEN ROOFS

MEDIUM COST



COST

## LONG TERM SAVINGS

- PHOTOVOLTAICS
- WIND TURBINES
- GEOTHERMAL
- DOUBLE-SKIN FACADES

HIGHER COST



DISCUSSION

## II. What is LEED

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# About USGBC

- **United States Green Building Council**

- Certification, GreenBuild
- Advocacy, Education, Center for Green Schools
- Member & Chapter Support

- **84 Corporate Donors**

- **\$75M Revenue \$45M Assets**

- **77 Chapters**

- **181,000 AP Professionals**

- **13,000 Member Organizations**

- **900+ Employees**



# Sustainable Alternatives

- **LEED**
- **Deep Green Initiative**
- **Kyoto Protocol – 1997 International Reduction in CO2**
- **ACUPCC – American Colleges & Universities Presidents Climate Commitment – 650 Schools/ 80% CO2 Reduction**
- **Green Energy Star**
- **Active Homes**



# Exceeding Our Carrying Capacity

- **The Global Impact of Being Un-Sustainable**
- **Environmental Management**
  - Atmosphere, Fresh Water & Oceans, Land Use
- **Human Consumption**
  - Energy, Water, Food, Materials, Toxic Substances, Waste
- **Economic**
  - Opportunity, Growth
- **Social**
  - Peace, Poverty, Security



# What is Green Design

- **Design and construction practices that significantly reduce or eliminate the negative impact of buildings on the environment and occupants in five broad areas:**
  - Sustainable Site Planning
  - Safeguarding Water and Water Efficiency
  - Energy Efficiency and Renewable Energy
  - Conservation of Materials and Resources
  - Indoor Environmental Quality

# Why was LEED Created

- **Facilitate positive results for the environment, occupant health and financial return**
- **Define “green” by providing a standard for measurement**
- **Prevent “greenwashing” (false or exaggerated claims)**
- **Promote whole-building**
- **Integrated design processes**



# Benefits of Green Building

- **Environmental Benefits**

- Reduce the Impacts of Natural Resource Consumption

- **Economic Benefits**

- Improve the Bottom Line

- **Health and Safety Benefits**

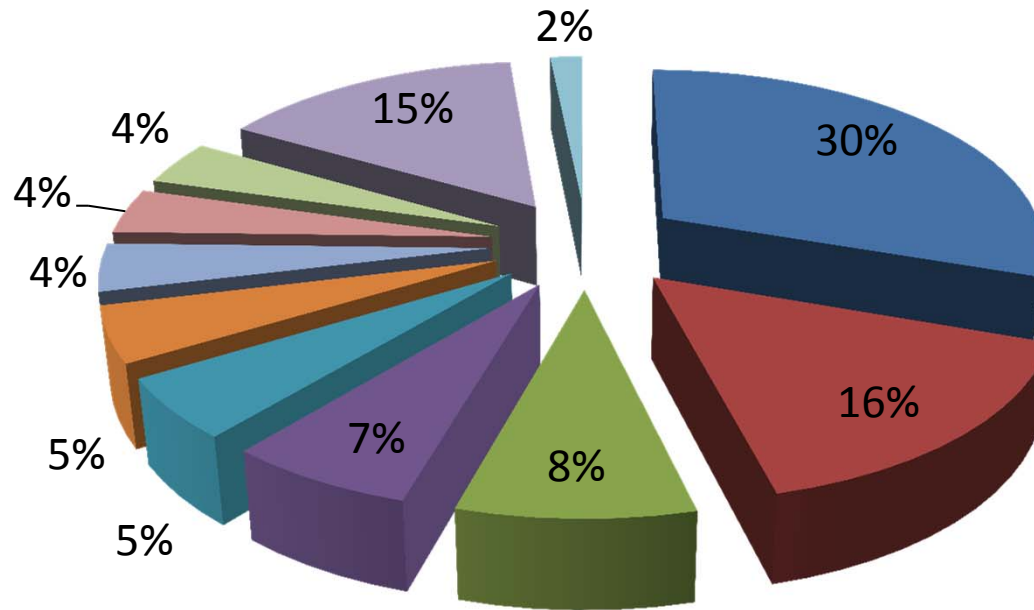
- Enhance Occupant Comfort and Health

- **Community Benefits**

- Minimize Strain on Local Infrastructures and Improve Quality of Life

# LEED Market transformation

## LEED by Building Type



USGBC

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# LEED Certification Process

- **A three step process:**
  - Step 1: Project Registration
    - LEED Letter Templates, CIR access, and on-line project listing
  - Step 2: Technical Support
    - Reference Package
    - Credit Inquiries and Rulings (CIR)
  - Step 3: Building Certification
    - Upon documentation submittal and USGBC review



# LEED Certification benefits

## ▪ Recognition of Quality Buildings and Environmental Stewardship

- Third party validation of achievement
- Qualify for growing array of state and local government incentives
- Contribute to growing knowledge base
- LEED certification plaque to mount on building
- Official certificate
- Receive marketing exposure through USGBC Web site, case studies, media announcements

USGBC

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# LEED Rating System

## Rating System Contains:

- 8 Prerequisites
- 5 Innovation & Design
- 4 Regional Priority Credits
- 1 LEED Accredited Professional
- 110 Total Credits

## Certification Thresholds

- Certified 40-49
- Silver 50-59
- Gold 60-79
- Platinum 80-and up

**LEED 2009 for New Construction and Major Renovations**  
 Project Checklist  
 DePaul University, Liberty Center - Fitness Center Expansion  
 1/11/2017

Section	Requirement	Points	Notes
<b>Sustainable Sites</b> Possible Points: 26	Prereq 1: Construction Activity Pollution Prevention	1	OK
	Prereq 2: Site Selection	1	OK
	SS-1: Development Density and Community Connectivity	3	OK
	SS-2: Brownfield Redevelopment	1	OK
	SS-3: Alternative Transportation - Public Transportation Access	2	OK
	SS-4: Alternative Transportation - Bicycle Storage and Changing Rooms	1	OK
	SS-5: Alternative Transportation - Low-Volatility and Fuel-Efficient Vehicles	1	OK
	SS-6: Alternative Transportation - Parking Capacity	2	OK
	SS-7: Site Development - Protect or Restore Habitat	1	OK
	SS-8: Site Development - Maximize Open Space	1	OK
	SS-9: Stormwater Design - Quantity Control	1	OK
	SS-10: Stormwater Design - Quality Control	1	OK
	SS-11: Heat Island Effect - Non-roof	1	OK
SS-12: Heat Island Effect - Roof	1	OK	
SS-13: Light Pollution Reduction	1	OK	
<b>Water Efficiency</b> Possible Points: 10	Prereq 1: Water Use Reduction - 20% Reduction	1	OK
	WE-1: Water Efficient Landscaping	2	OK
	WE-2: Reduce Outdoor Water Consumption by 40%	2	OK
	WE-3: Innovative Water Use or Irrigation	2	OK
<b>Energy and Atmosphere</b> Possible Points: 35	Prereq 1: Fundamental Commissioning of Building Energy Systems	1	OK
	Prereq 2: Minimum Energy Performance	1	OK
	Prereq 3: Fundamental Refrigerant Management	1	OK
	EA-1: Optimize Energy Performance	32	OK
<b>Indoor Environmental Quality</b>	EQ-1: Enhanced Indoor Air Quality	2	OK
	EQ-2: Enhanced Refrigerant Management	1	OK

# LEED Rating System

- **Sustainable Sites - 26**

- credits encourage strategies that minimize the impact on ecosystems and water resources.

- **Water Efficiency - 10**

- credits promote smarter use of water, inside and out, to reduce potable water consumption.

- **Energy & Atmosphere - 35**

- credits promote better building energy performance through innovative strategies.

- **Materials & Resources - 14**

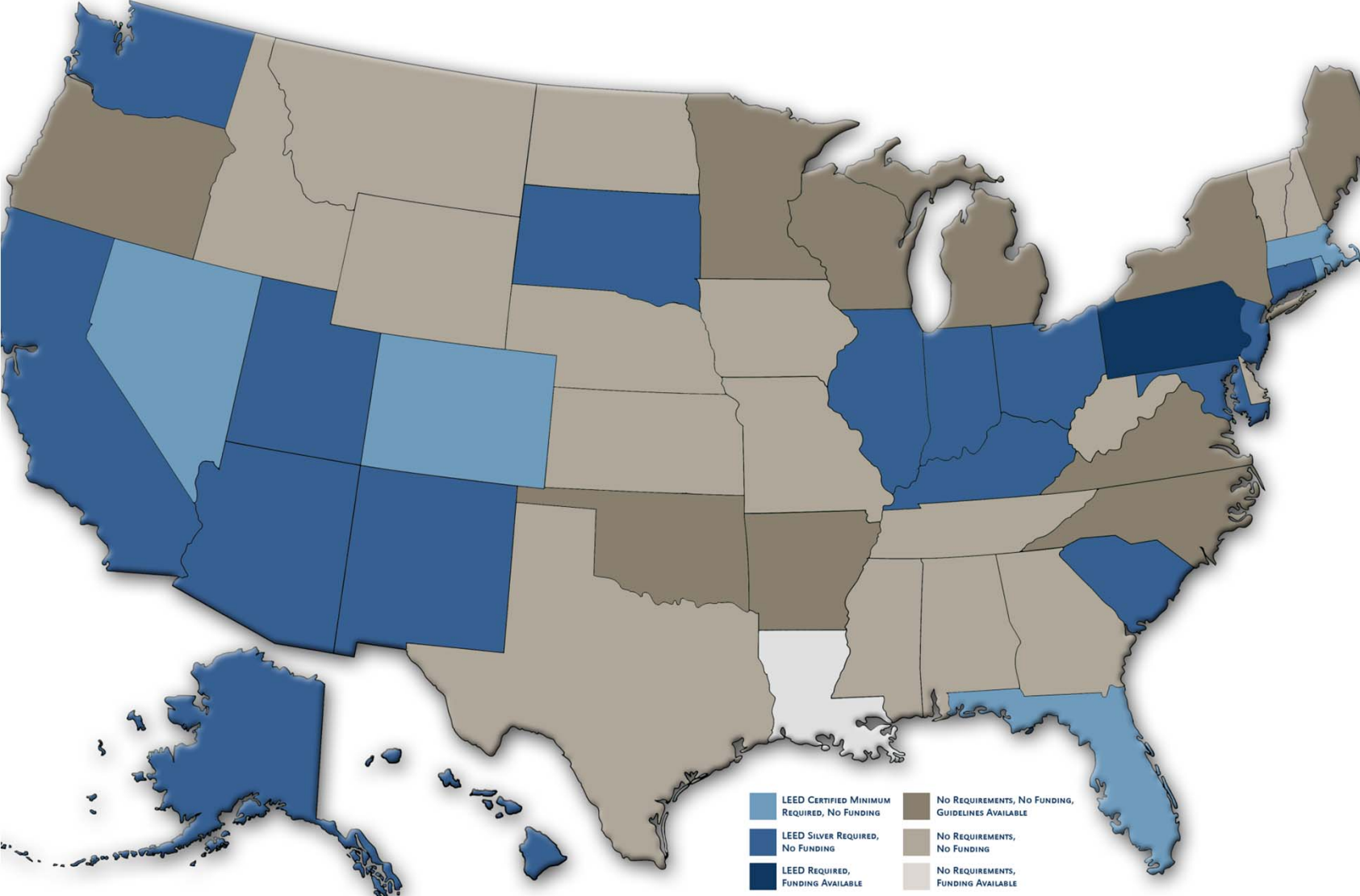
- credits encourage using sustainable building materials and reducing waste.

- **Indoor Environmental - 15**

- quality credits promote better indoor air quality and access to daylight and views



# The Unfunded Mandate



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# How is Your State Going LEED

## ■ Top Five States

- Colorado (2.74 sq. ft. per capita)
- Illinois (2.69)
- Virginia (2.42)
- Washington (2.18)
- Maryland (2.07)

## ■ Bottom Three States

- Delaware (0.03)
- West Virginia (0.14)
- Mississippi (0.21)

## ■ National Average 2011 (1.81 sq. ft. per capita)

# What's Happened to LEED?

- *The intend is good ...the delivery is questionable*
- *It's a measurement tool not a design tool*
- *LEED started with three people in a room with an idea that grew into a global standard*
- *It's a money making political machine*
- *'Sustainable development' is an oxymoron*

# III. Examples

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# Example – Photo Voltaic Panels

- **Solar Energy Source**
- **Grant/Donor Funded**
- **South Exposure on Field House Roof**
- **\$250,000 Investment**
- **54 KW System**
- **Payback 25 Years**
  - Energy Cost Inflation
  - PV Output Loss



# Example – Exterior Sun Shades

## ■ Annual Energy Cost

- \$32,000 (with shades)
- \$47,000 (without shades)
- \$150,000 – 10 Year Savings

## ■ Shade Cost

- < \$92,000
- Assuming 5% ROI

## ■ Other Considerations

- Building Scale
- Shade Outdoor Space



# Example – HVAC Filters

- **50,000 SF Building**
- **\$250,000 Annual Utility & Maintenance Cost**
- **Quality Filters - \$4,000 Premium (Common VE Item)**
- **Benefits**
  - LEED Point
  - Lower Energy & Maintenance
  - Better Air Quality
- **1.6% Savings Required**
- **Like Replacement Is Key**



# Example – Occupancy Sensors

## ■ Benefits

- LEED Point
- Lower Energy Cost
- Longer Lamp Life

## ■ Simple Operation Is Key

## ■ Most Effective In Medium And Large Spaces

- Significant Lamps Per Sensor
- MP Space (2,000 SF)
- \$175/Sensor
- 2 Year Payback



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# Example – LED Light Fixtures

- **Benefits**

- LEED Point
- Lower Energy Cost
- Less Fixture Replacement
- Dimmable

- **Large Scale Space**

- **Evolving Technology**

- **Life-Cycle Cost Analysis Is Changing**

- 92% Energy Savings



# Example – Skylights

- **Benefits**

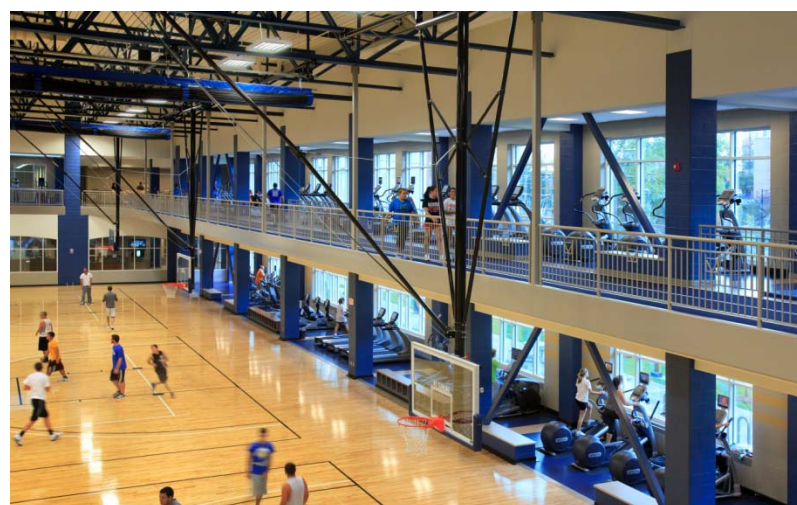
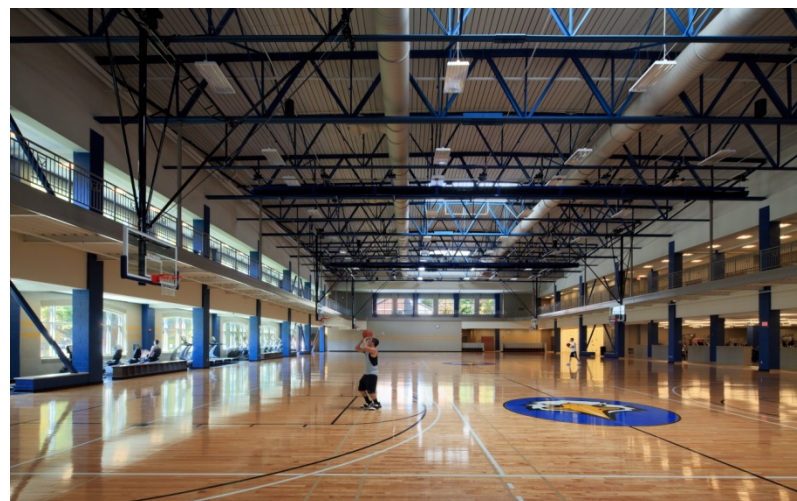
- Daylight
- Very Effective (3% Area)
- Lower Lighting Cost

- **Example**

- 50,000 SF Field House
- \$120,000 Premium
- \$32,000 Annual Lighting Cost

- **Must Turn Off Lights!  
(Photocells Required)**

- **If Wal-Mart Uses Them ...**



# Example – Pool Covers

## ■ Benefits

- LEED POINT
- GOOD PROCEDURE TO INSTALL
- COVER 8 HOURS/DAY
- 25% ENERGY SAVINGS

## ■ Example

- 25yd x 25M Pool
- \$170,000 Cost
- \$38,000 Savings/Year

## ■ 4.5 Year Pay Back

## ■ Does Not Include Labor Cost



# Example – Electric Generation

## ■ Benefits

- Feel Good Participation
- Is Truly Recreational

## ■ Example

- 100 Watts/Hour
- 24 Hours/Day (10 Hours/Day)
- 365 Day/Year (250 Days)
- 6.5 Cents/Kilowatt (5.5 Cents)
- \$1,150/Unit

## ■ 20 Year Payback

## ■ Really Never



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# Example – Reduced Mechanical

- **Benefits**

- The Feel of Natural Ventilation
- User Control
- Energy Reduction

- **Example**

- “Big Ass Fans”
- 10 degree Perceived Reduction in Temperature
- 5 Degree Actual
- 4% Energy Savings

- **8-10 Year Payback**



# IV. Cost of LEED

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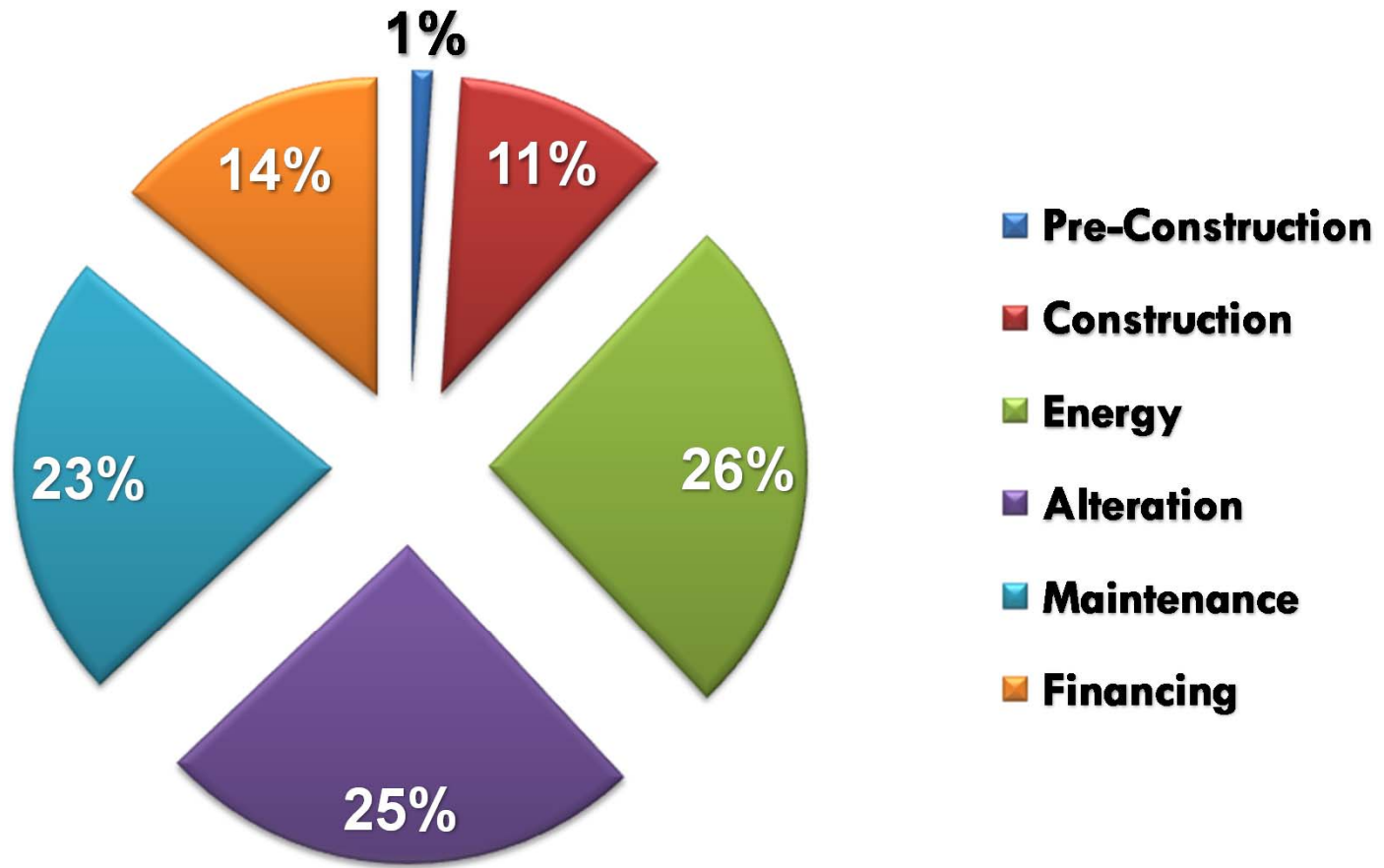
EXAMPLES

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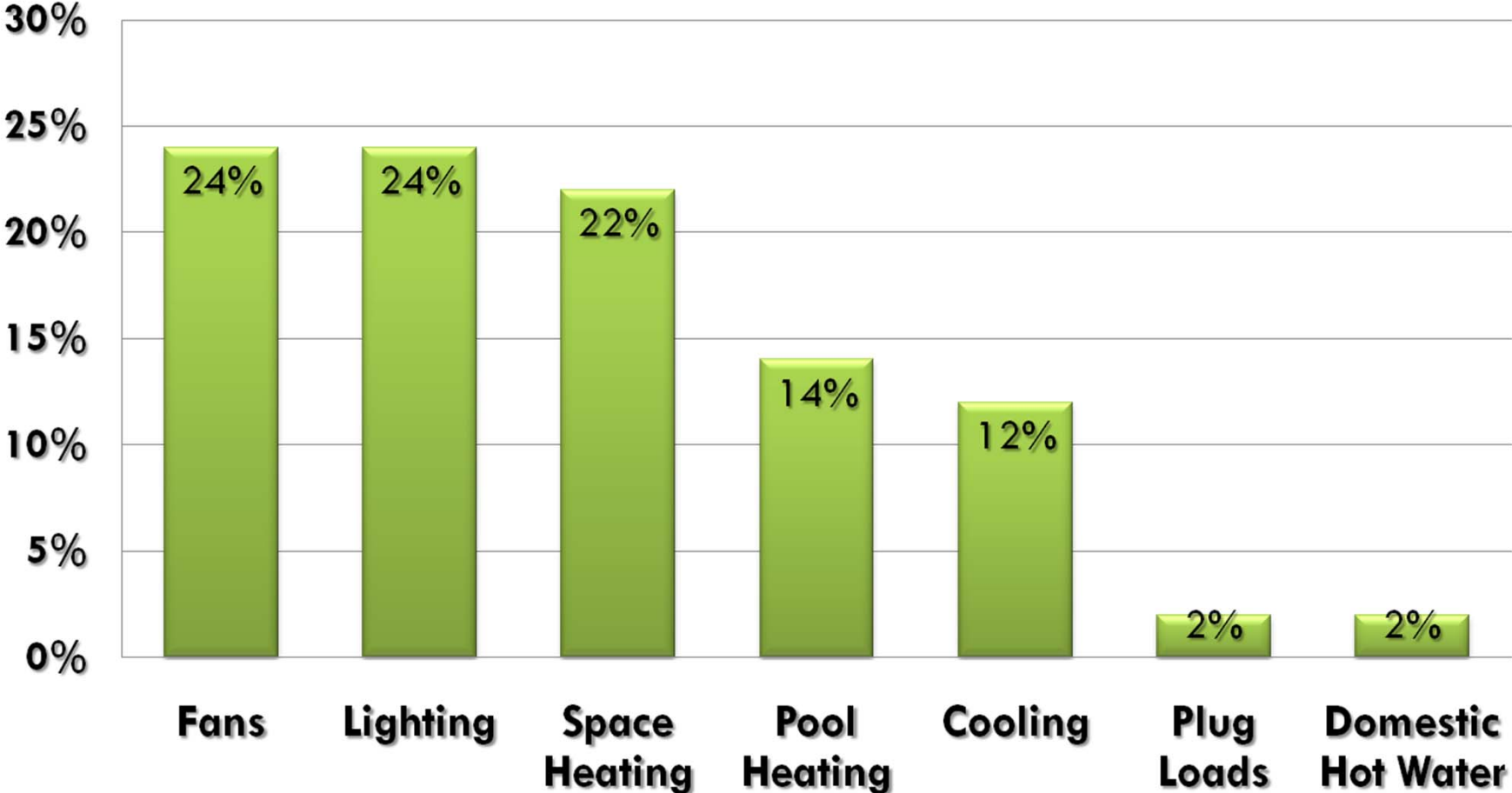
# Consider Long Term Investment

## ▪ Lifetime Building Cost Break Down



# Sustainability – Energy

### Energy Consumption (Central Midwest)





# Sustainability – Evaluation

- **Seek Life Cycle Cost Savings**

- 5 – 10 Year Payback Period

- **Consider Proven Systems**

- **Pursue Funding Options**

- Grant Money
- Tax Credits
- Utility Rebate Programs
- Donor Support

- **Substance vs. Image**

- True Sustainability
- Feel Good Gestures



# Sustainability

- **Widespread Popularity**
- **Sustainability = Enhanced Environment**
- **Smart Sustainability = Measured Value (Save Money)**
- **Achievable Payback**
  - 5 – 10 Year Target
- **Substance vs. Image**
  - True Sustainability
  - Feel Good Gestures
- **Sustainable Appeal**
  - Energy Hog vs. Unappealing



# Sustainability – LEED

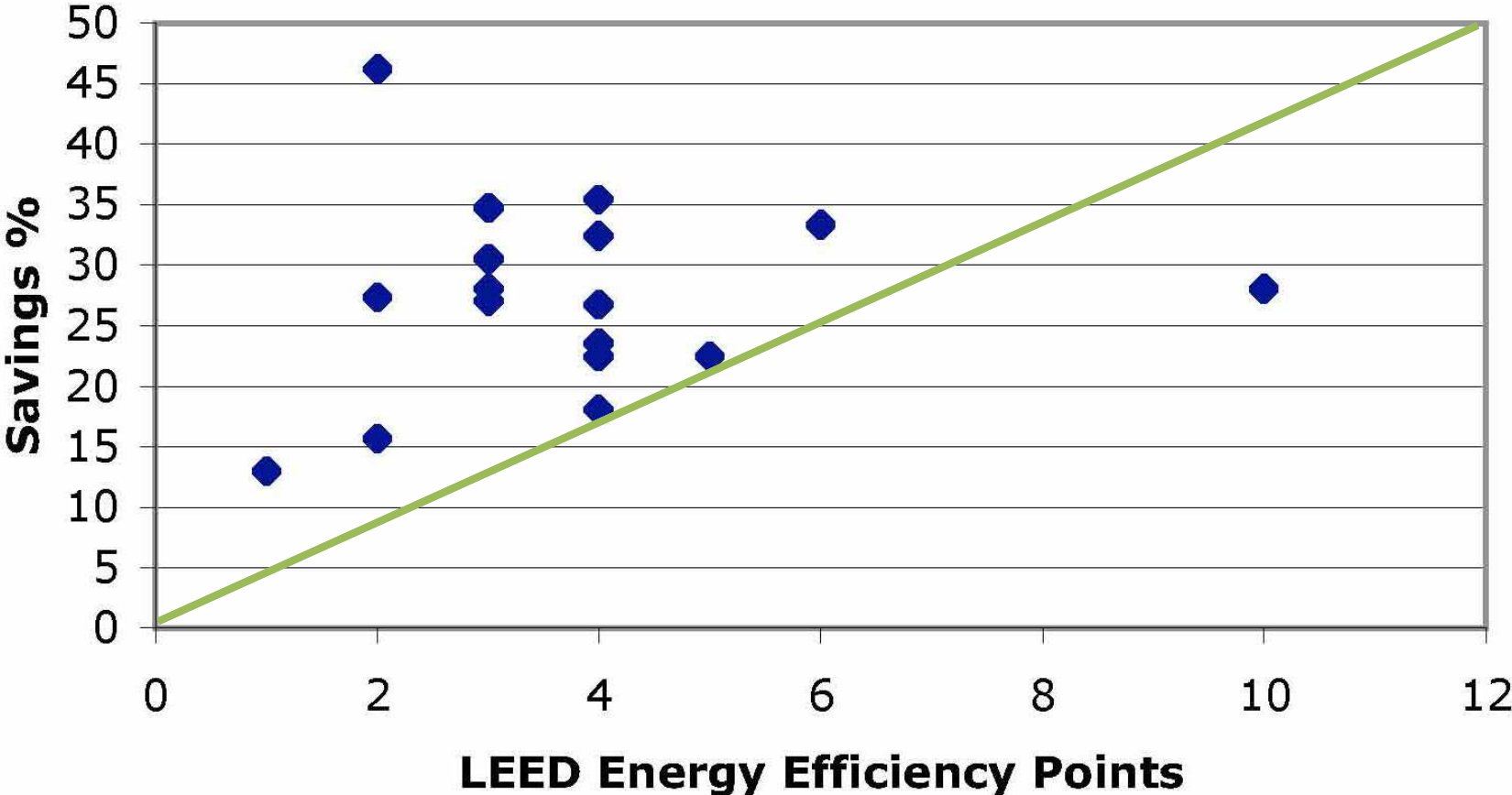
- **LEED Buildings Used 18-39% Less Energy On Average**
- **28-35% Of LEED Buildings Used More Energy**
- **Little Correlation Between Measured Energy Performance And Certification Level**

Guy R. Newsham, Sandra Mancini, Benjamin J. Birt

National Research Council Canada – Institute For Research In Construction

# Sustainability – LEED

## LEED Points vs. Measured Savings

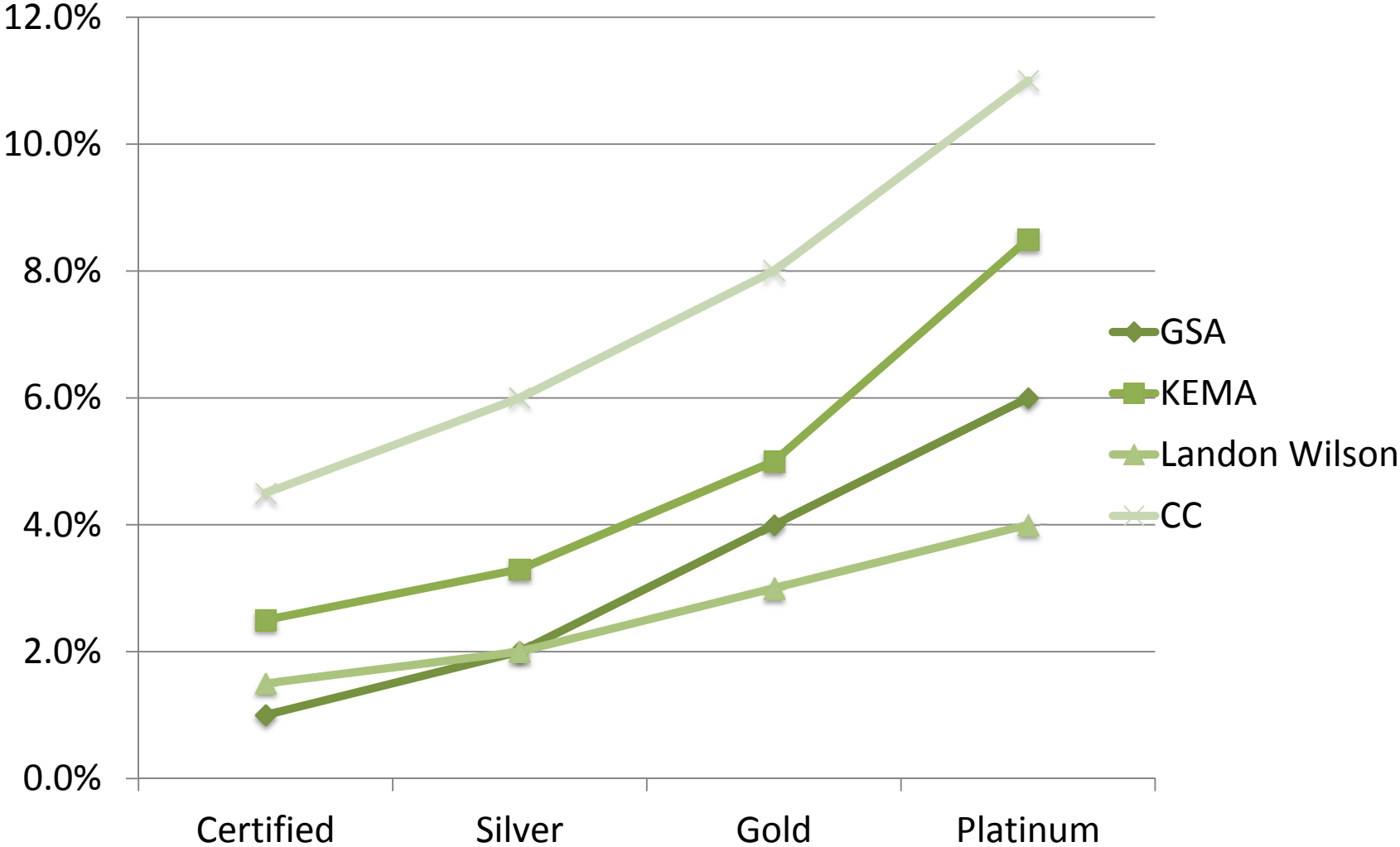


# The Cost of LEED

- **Fees**
  - USGBC Registration Fees
- **Cost of Documentation**
  - Architect, LEED Consultant,
  - In-House Team Member
- **Cost of Extra R&D**
  - Design Team
- **The Cost of Commissioning**
  - Third Party Consultant
- **Cost of Construction**

	Project <a href="#">Gross Floor Area</a> in Sq Ft (excluding all parking areas)			<a href="#">Expedited Review</a>
	Less than 50,000	50,000-500,000	More than 500,000	
<b>Registration</b>				
USGBC Silver, Gold and Platinum Members	\$900			N/A
Organizational or Non-Members	\$1,200			
<a href="#">Precertification Review</a> (Optional, LEED CS only)				
USGBC Silver, Gold and Platinum Members	\$3,250			\$5,000 surcharge
Organizational or Non-Members	\$4,250			
<b>Standard Review</b>	Flat rate	Per Sq Ft	Flat rate	
Design & Construction Review				
USGBC Silver, Gold and Platinum Members	\$2,250	\$0.045/sf	\$22,500	\$10,000 surcharge
Organizational or Non-Members	\$2,750	\$0.055/sf	\$27,500	
<b>Split Review</b>	Flat rate	Per Sq Ft	Flat rate	
Design Review				
USGBC Silver, Gold and Platinum Members	\$2,000	\$0.04/sf	\$20,000	\$5,000 surcharge
Organizational or Non-Members	\$2,250	\$0.045/sf	\$22,500	
Construction Review				
USGBC Silver, Gold and Platinum Members	\$500	\$0.010/sf	\$5,000	\$5,000 surcharge
Organizational or Non-Members	\$750	\$0.015/sf	\$7,500	
<b>Appeals</b>				
<a href="#">Complex credits</a>	\$800/credit			\$500/credit surcharge
All other credits	\$500/credit			

# The Cost of LEED



# Least Used LEED Point

- **10% of materials such as beams and doors are reused or salvaged** **4.7%**
- **Reuse existing building elements** **5.6%**
- **Use on-site renewable energy** **6.6%**
- **rapidly renewable materials such as bamboo** **7.2%**
- **5% of materials such as beams and doors are reused or salvaged** **7.3%**

# Least Used LEED Points

- Reuse 95% of a building exterior 8%
- Use on-site renewable energy 9.9%
- Boost energy performance 42% 9.9%
- Reduce use of potable water in wastewater 12.5%
- Reuse 75% of a building exterior 13.2%





# Most Used LEED Points

- **Hire LEED accredited professional** **99.7%**
- **Use low-emitting paints and coatings** **93.3%**
- **Boost energy performance 10.5%** **92.2%**
- **Use low-emitting adhesives and sealants** **91.5%**
- **Use recycled materials in construction** **90.9%**



# Most Used LEED Points

- **Reduce water use by 20%** **90.6%**
- **Use low-emitting carpet** **89.7%**
- **Divert 50% construction waste from landfill** **89.6%**
- **Boost energy performance 14%** **89.0%**
- **Water-efficient landscaping** **86.9%**



# V. SUMMARY

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# Summary

- **LEED is not Perfect**
- **Sustainability is Here to Stay**
- **It's In our DNA, Laws and Codes**
- **It's Not Free But It's Affordable**
- **And Don't Think of Sustainability as Adding to Your Project But Instead Being an Integral Part of It**



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