



The Good, The bad, and The Ugly of LEED Design



2013

Hastings+Chivetta
ARCHITECTURE • PLANNING • ENGINEERING



Erik J. Kocher, AIA, LEED AP

Principal

ekocher@hcarchitects.com

www.hastingschivetta.com



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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

- NIRSA & Sustainability
- How Big Is It?

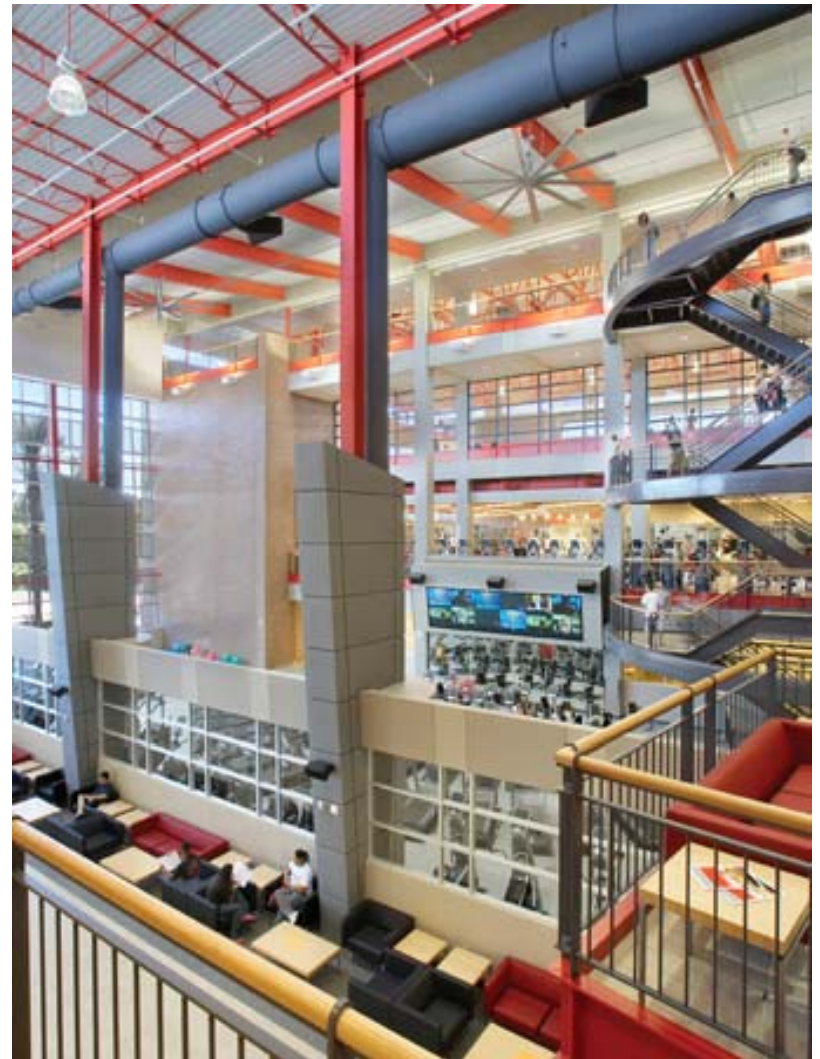
II. What is LEED

- History
- Process
- Rating System

III. Examples

IV. Cost

V. Discussion



I. INTRODUCTION

INTRODUCTION

WHAT IS LEED

EXAMPLES

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NIRSA's Six Strategic Values

- Leadership
- Service
- Health & Wellbeing
- Equity, Diversity & Inclusion
- Global Perspectives
- Sustainable Communities



NIRSA's Commitment to Sustainability



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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**
- **NIRSA member projects** **\$3,967,554,422**

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

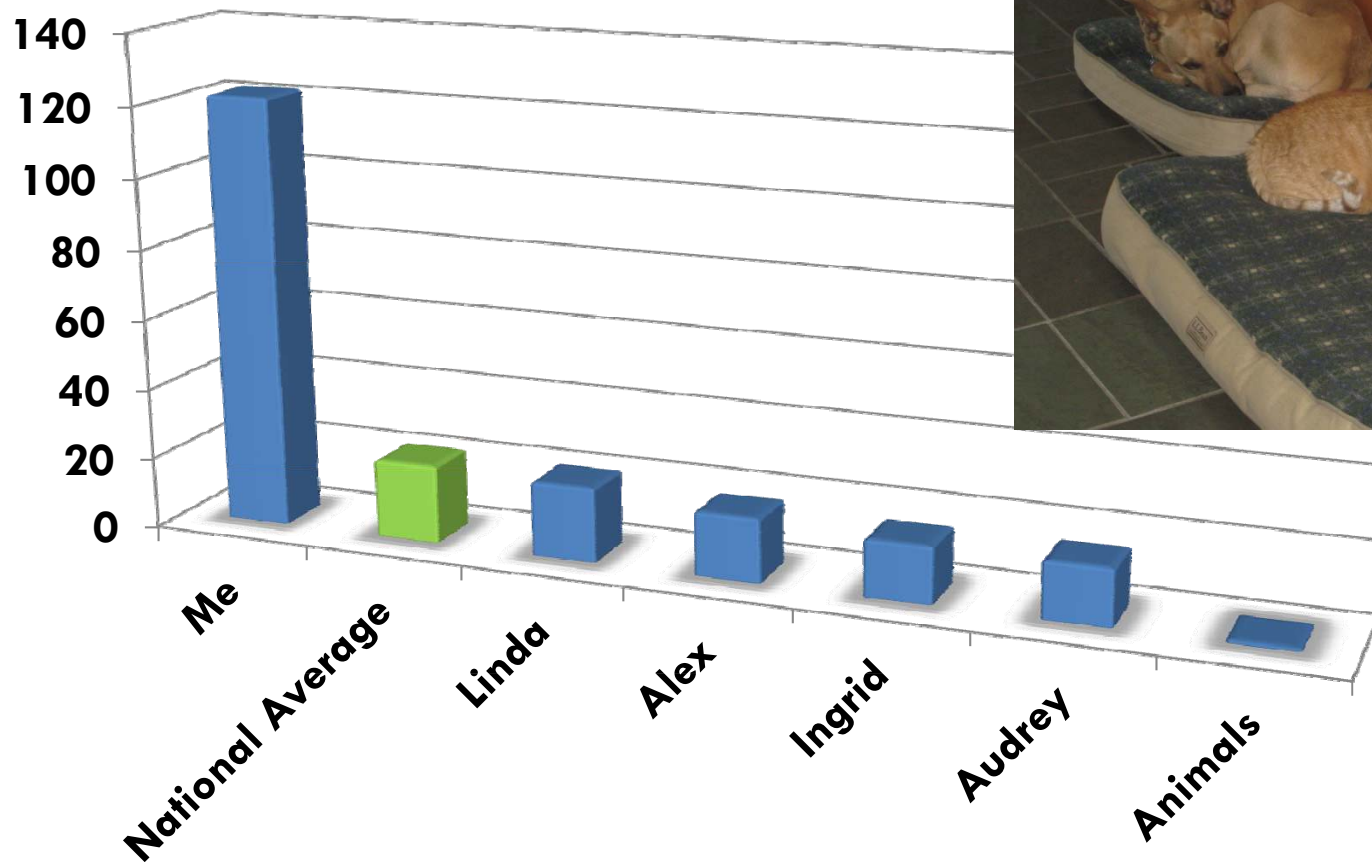
Source: REED Construction Data, Inc.
NIRSA

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

Athletic + Recreation 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**

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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
- MOREHEAD STATE
- TEMPLE UNIV.
- DENISON UNIV.



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



- BERA 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**



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**

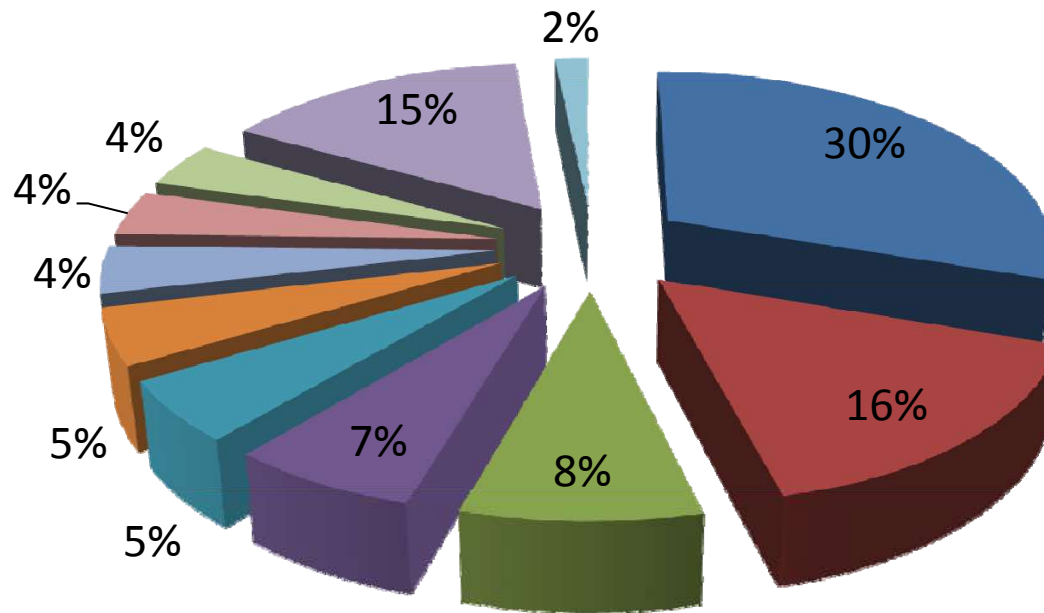
- Enhance Occupant Comfort and Health

- **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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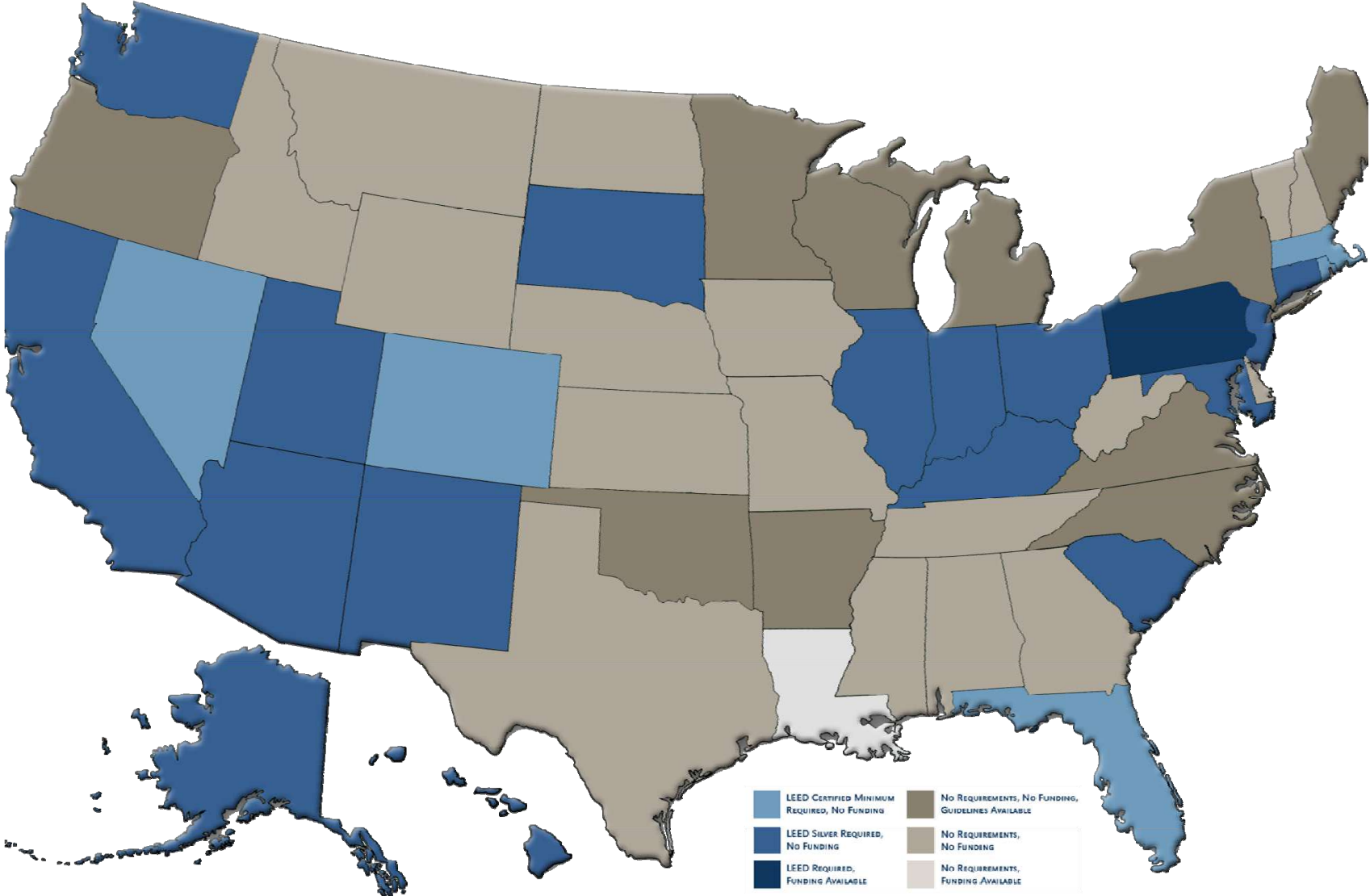
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LEED Rating System

- **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**

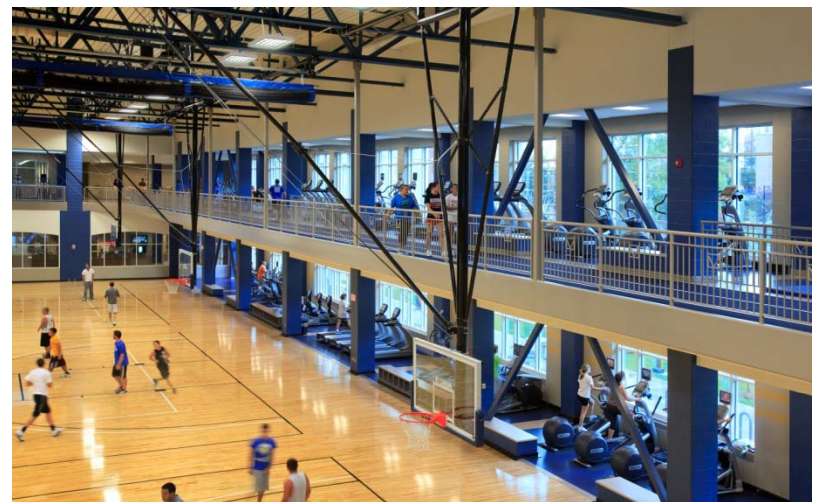
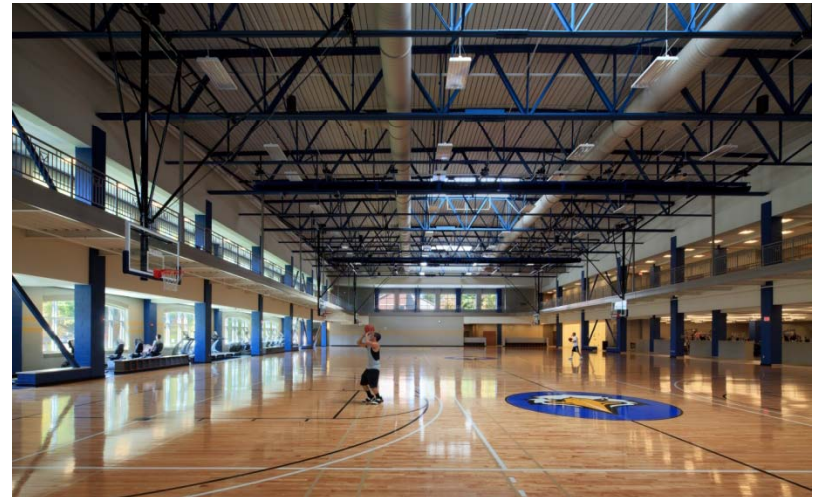
- Daylight
- Very Effective (3% Area)
- Lower Lighting Cost

- **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

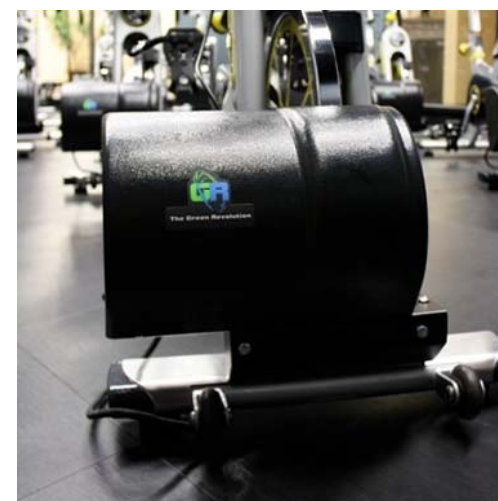
- Feel Good Participation
- Is Truly Recreational

■ 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



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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WHAT IS LEED

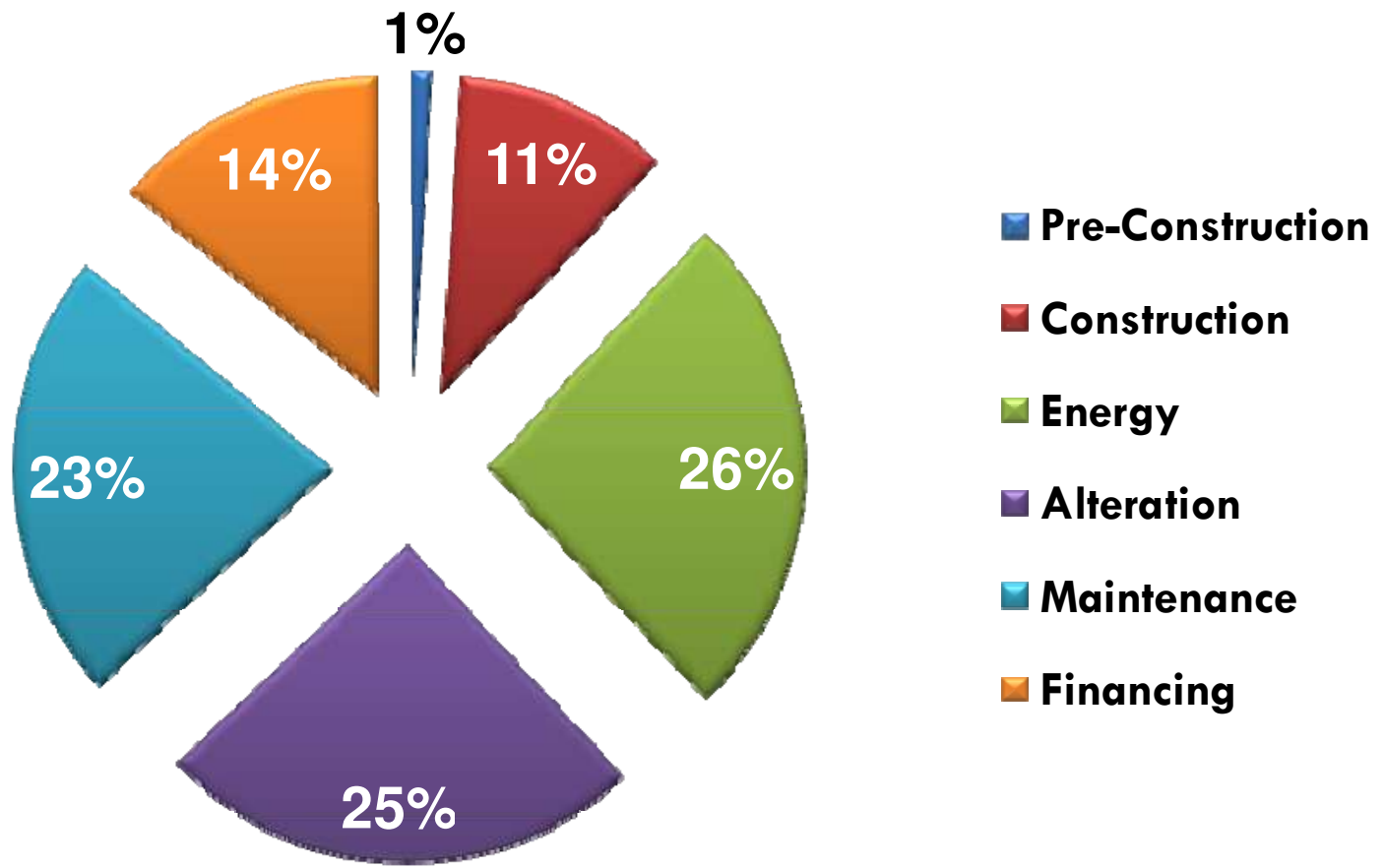
EXAMPLES

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Consider Long Term Investment

▪ Lifetime Building Cost Break Down



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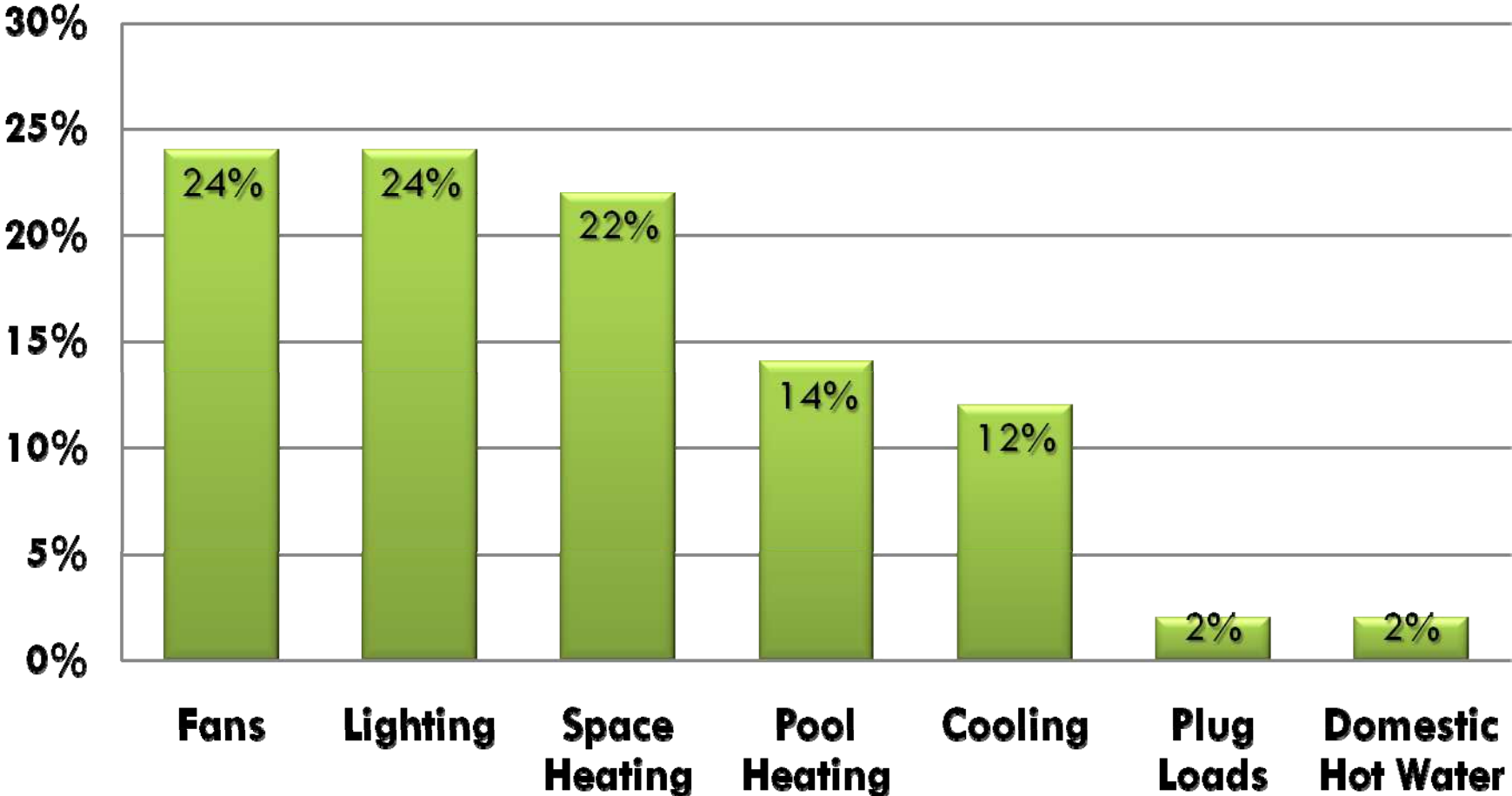
EXAMPLES

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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 – LEED

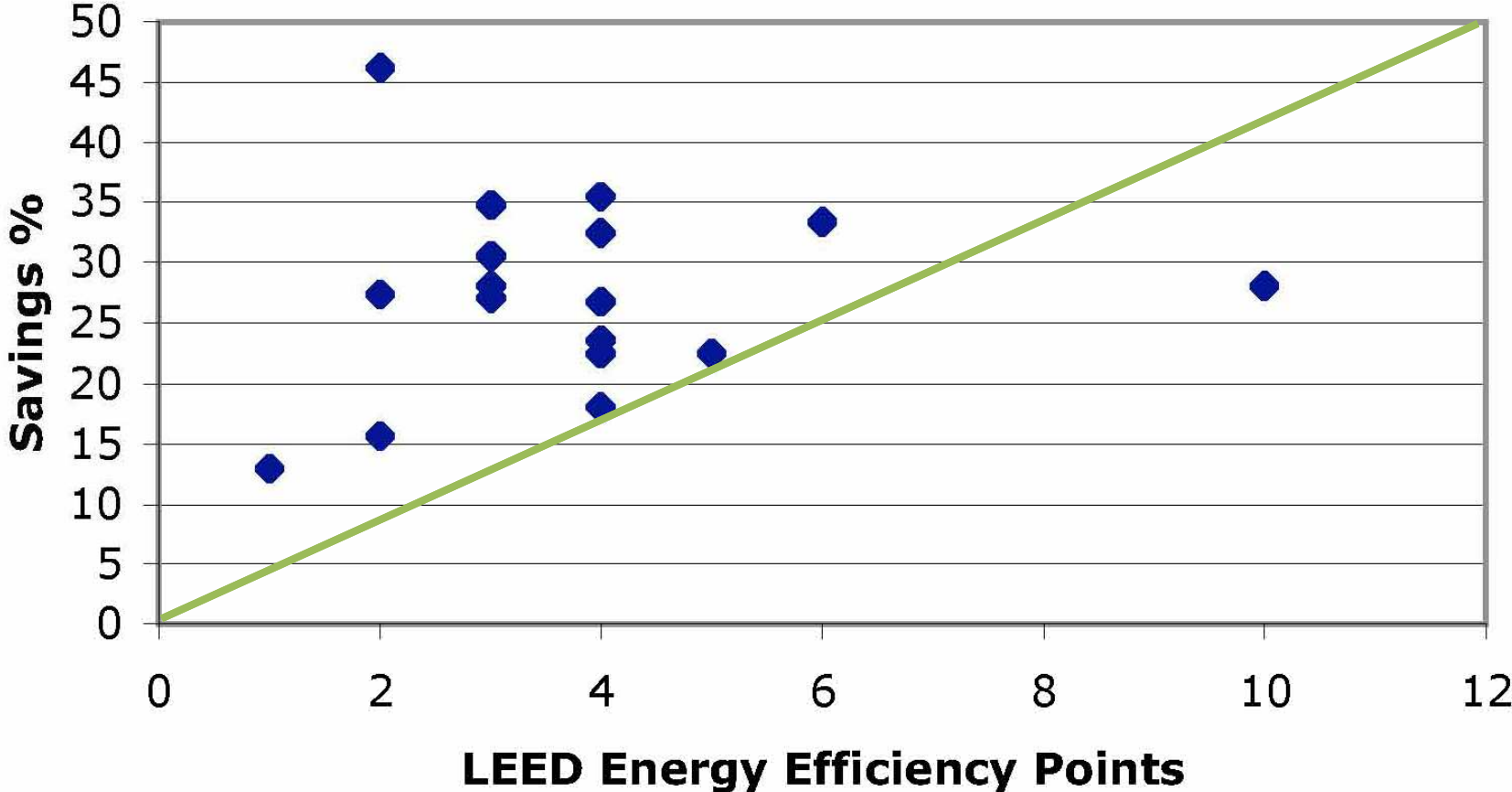
- **LEED Buildings Used 18-39% Less Energy On Average**
- **28-35% Of LEED Buildings Used More Energy**
- **Little Correlation Between Measured Energy Performance And Certification Level**

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

National Research Council Canada – Institute For Research In Construction

Sustainability – LEED

LEED Points vs. Measured Savings

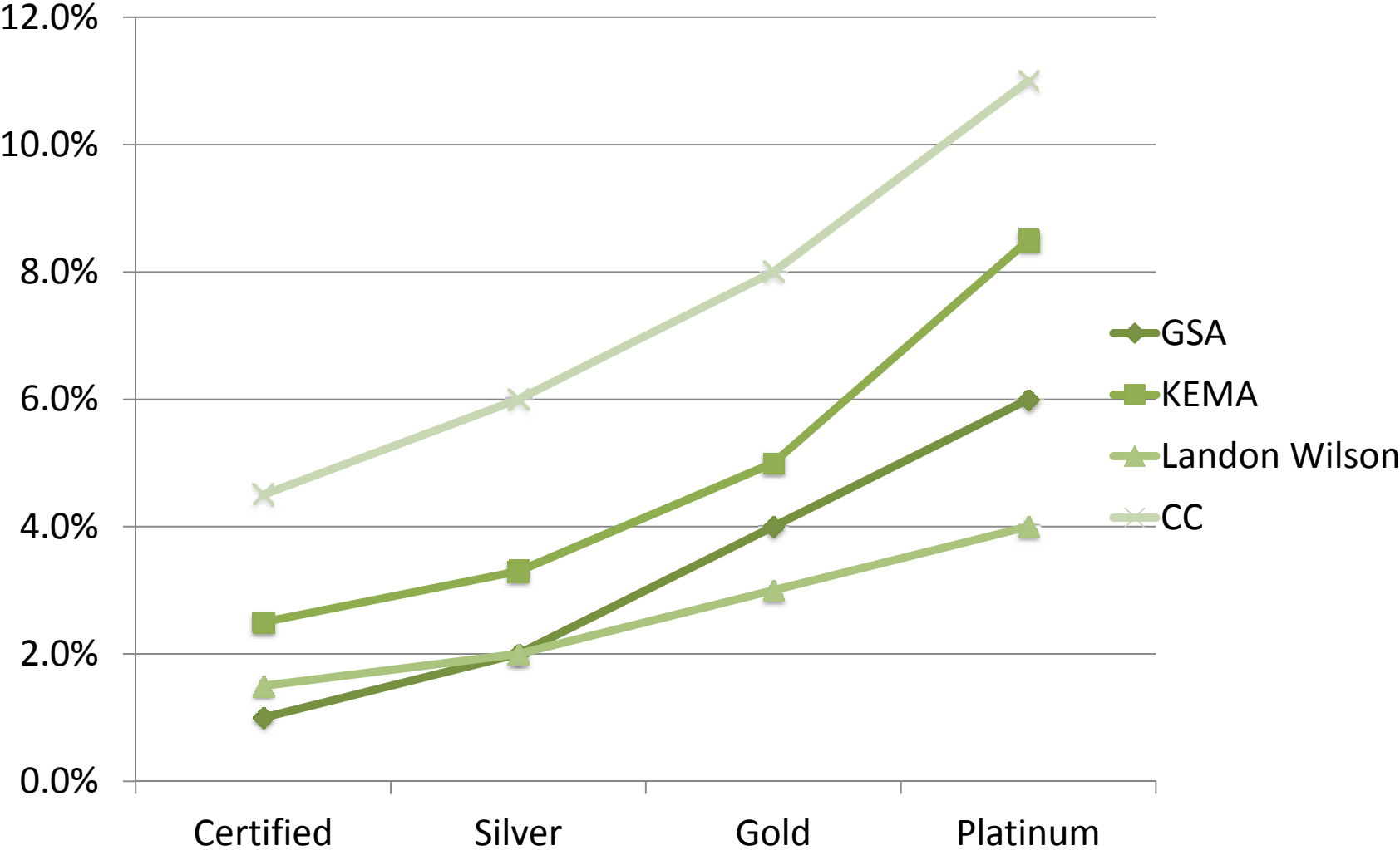


The Cost of LEED

- **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 Gross Floor Area in Sq Ft (excluding all parking areas)			Expedited Review
	Less than 50,000	50,000-500,000	More than 500,000	
Registration				
USGBC Silver, Gold and Platinum Members	\$900			N/A
Organizational or Non-Members	\$1,200			
Precertification Review (Optional, LEED CS only)				
USGBC Silver, Gold and Platinum Members	\$3,250			\$5,000 surcharge
Organizational or Non-Members	\$4,250			
Standard Review	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	
Split Review	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	
Appeals				
Complex credits	\$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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