The Economics of LEED for Existing Buildings









Introduction to Leonardo Academy

- A Charitable (501c3) nonprofit organization
- Mission: advancing sustainability
- A Think and Do Tank
 - Develops new approaches and methods for sustainability
 - Supports implementation of new approaches and methods
- Areas of Work
 - Overall sustainability for organizations
 - LEED® implementation and certification support
 - Emissions footprints, reduction strategies and offsets
 - Cleaner and Greener Program certifies achievements
 - ANSI Sustainability Standards Development
 - Emissions, organizations, vehicles, sustainable agriculture products





LEED-EB Economics: Based on Leonardo Academy 2008 Study

- "The Economics of LEED for Existing Buildings, 2008 Edition"
- About the Study:
 - All building owners/managers of LEED-EB certified buildings were sent a cost survey in 2006 & 2007
 - 23 LEED-EB building owners/managers responded (43% response rate)

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- Gathered data on LEED-EB Pilot and V2.0
- See full report at: <u>www.leonardoacademy.org</u>
- Report was sponsored by Johnson Controls



Mean Total Certification Costs by Certification Level



Mean Total Certification Costs by Certification Level (Using Current Member Registration & Application Fees)



Mean Certification Cost Components by Certification Level



Mean Certification Cost Components by Certification Level Using Current Member Registration & Application Fees



Mean Soft Cost Components by Certification Level



Mean Soft Cost Components by Certification Level Using Current Member Registration & Application Fees



Mean Certifications Costs for All Certification Levels Combined

	Mean	Median	Minimum	Maximum
Staff Hours	0.013 hr	0.008 hr	0.001 hr	0.041 hr
Staff Costs (internal labor)	\$0.59	\$0.33	\$0.04	\$1.78
Consulting Costs	\$0.24	\$0.41	\$0.00	\$1.49
Registration Fee	\$0.02	\$0.01	\$0.00	\$0.10
Application Fee	\$0.01	\$0.01	\$0.00	\$0.04
Total Soft Costs	\$0.86	\$0.67	\$0.01	\$1.89
Total Soft Cost without internal labor	\$0.27	\$0.10	\$0.01	\$1.54
Total Hard Costs	\$0.73	\$0.11	\$0.00	\$3.14
Total: All Costs	\$1.58	\$1.52	\$0.02	\$5.01



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Mean Certifications Costs for All Certification Levels Combined Using Current Member Registration & Application Fees

	Mean	Median	Minimum	Maximum
Staff Hours	0.013 hr	0.008 hr	0.001 hr	0.041 hr
Staff Costs (internal labor)	\$0.59	\$0.33	\$0.04	\$1.78
Consulting Costs	\$0.24	\$0.41	\$0.00	\$1.49
Registration Fee	\$0.01	\$0.003	\$0.00	\$0.02
Application Fee	\$0.03	\$0.25	\$0.01	\$0.06
Other Soft Costs	\$0.01	\$0.00	\$0.00	\$0.06
Total Soft Costs	\$0.86	\$0.70	\$0.03	\$1.87
Total Soft Cost without internal labor	\$0.28	\$0.10	\$0.03	\$1.54
Total Hard Costs	\$0.73	\$0.11	\$0.03	\$3.14
Total: All Costs	\$1.59	\$1.55	\$0.03	\$5.01



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Cost Chart Definitions

– Soft Costs =

- Internal Labor + Consulting Costs + USGBC Registration Fees + USGBC Application Fees (Note: the 2 building added costs in an "other" category)
- Hard Costs =
 - Building improvement costs + equipment costs





Low/No Cost vs. Significant Costs

- Respondents were asked to identify which prerequisites and credits they found to be:
 - Low or no cost actions
 - Significant cost actions





Actions Found to be Low/No Cost vs. Significant Cost



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Individual Prerequisites – Actions Found to be Low/No Cost vs. Significant Cost

Number	Prerequisite Detail	Percent of Respondents Indicating this is a "no or low cost" measure
SS Prereq 1	Erosion and Sedimentation Control	95.5%
SS Prereq 2	Age of Building	95.5%
WE Prereq 1	Minimum Water Efficiency (Baseline increased in EM O&M)	95.5%
WE Prereq 2	Discharge Water Compliance	100.0%
EA Prereq 1	Existing Building Commissioning (Moved to Credit in EB O&M)	43.5%
EA Prereq 2	Minimum Energy Performance	72.7%
EA Prereq 3	Ozone Protection	90.9%
MR Prereq 1.1	Source Reduction and Waste Management: Waste Stream Audit	90.9%
MR Prereq 1.2	Source Reduction and Waste Management: Storage & Collection of Recyclables	95.5%
MR Prereq 2	Reduced Mercury in Light Bulbs (Moved to Credit in EB O&M)	77.3%
IEQ Prereq 1	Outside Air Introduction and Exhaust Systems	68.2%
IEQ Prereq 2	Environmental Tobacco Smoke (ETS) Control	100.0%
IEQ Prereq 3	Asbestos Removal or Encapsulation	86.4%
IEQ Prereq 4	PCB Removal	86.4%

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LEED-EB Prerequisite Cost Curve

Per Cent Respondents Identifying as Significant Cost



LEED-EB Credit Cost Curve

Per Cent Respondents Identifying as Significant Cost



Key Changes in LEED-EB Versions From: v2.0 to vO&M to vO&M 2009 With Cost Impacts

- Energy Prerequisite (EAp2)
 - v2.0 before June 2007:
 - v2.0 after June 2007:
 - vO&M:
 - vO&M 2009

- Min. Energy Star Score: 60
- Min. Energy Star Score: 67
- Min. Energy Star Score: 69
- Min. Energy Star Score: 69





Key Changes in LEED-EB Versions From: v2.0 to vO&M to vO&M 2009 With Cost Impacts

Commissioning

- v2.0:

- » Prerequisite: Full commissioning in 1-5 years
- » Credit: 1 point for additional commissioning

- vO&M:

- » Prerequisite: Operating plan plus basic energy audit
- » Credit: 6 points for implementing commissioning

– vO&M:

- » Prerequisite: ??Operating plan plus basic energy audit
- » Credit: ??6 points for implementing commissioning

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Key Changes in LEED-EB Versions From: v2.0 to vO&M to vO&M 2009 With Cost Impacts

• Water Fixture Prerequisite (WEp1)

- V2.0:

- » All Fixtures:
- » Baseline = Water use of EPACT fixtures x 1.2

– O&M:

- » Fixtures installed before 1994:
- » Baseline = Water use of IPC/UPC-2006 fixtures x 1.6
- » Fixtures installed 1994 or later:
- » Baseline = Water use of EPACT fixtures x 1.2
- Water Fixture Points (WEc2)
 - V2.0: 2 points, O&M: ?4 points





LEED-EB Operating Costs

- Respondents were asked for specific operating costs for their buildings.
- The responses were broken down to per square foot costs.
- Then compared to the 2007 BOMA data available for their region.





Operating Costs LEED-EB Certified Buildings vs. BOMA Averages



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Competitive Market-Based Benefits of Sustainable Buildings







The Competitive Market: Creating Financial Benefits for Certification

- As benefits of LEED Certified buildings gain recognition in the marketplace these will be recognized in financial transactions:
 - Building insurance rates:
 - The impact of sustainability on sales in retail environments is starting to be recognized.
 - Office Building Leasing





Reduced Building Insurance Costs

– For LEED Certified buildings:

- Provides reduced building insurance rates
- If the building is destroyed, they provide coverage for rebuilding to LEED standards
- All commercial buildings they insure:
 - If the building is destroyed, they provide coverage for rebuilding to LEED standards
- Note: Fireman's Fund Insurance was the first insurance company to offer this type of benefits in 2006 and now 4 or 5 insurance companies provide some sort of LEED certification benefits.





Increased Sales in Sustainable Buildings

Skylighting and Retail Sales, Heshong Mahone Group, 1999

- All other things being equal, an average non-skylit store in the chain would likely have 40% higher sales with the addition of skylights, with a probable range between 31% and 49%. This was found with 99% statistical certainty.
- If a typical non-skylit store were averaging sales of \$2/sf, then its sales might be expected to increase to between \$2.61 and \$2.98 with the addition of a skylighting system.





Commercial Office Buildings – Impact of LEED Certification

- Increased Occupancy: 4.1 % *
- Increased Rents:
- Increased Sale Price: \$171 per sq. ft.*

- * Ref: CoStar Report. March 26, 2008



\$ 11.33 per sq. ft.*



The Competitive Market: Expect Growth in Financial Benefits for LEED Certification

- The door has been opened for financial recognition in the competitive marketplace of the benefits of LEED certification!
- Expect the scope and magnitude of financial recognition to expand in the future.





The Soft Benefits of LEED Buildings

Soft Now but Expected to be Powerful in the Future - Occupant Productivity, etc.



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Overview of the Soft Benefits of LEED

- While the soft benefits of LEED are a nice positive extra now, as the evidence on these benefits grow they will become a compelling driver for increased building sustainability.
- The current soft benefits include:
 - Occupant productivity
 - Recruiting
 - Reduced turnover
 - Increase sales in retail buildings
 - Reduced building insurance costs
 - Potential for reduce health care costs





Why is increasing occupant productivity so important?





Occupants' Salaries are 85% of the Cost of Office Building Operation



* 1991 Source: BOMA, EPRI, Statistical Abstract in RMI "Greening the Building and the Bottom Line, 1994

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Studies on Increased Occupant Productivity in Sustainable Buildings





LEED (NC) Case Study: Productivity at West Bend Mutual Insurance



LEED-EB Case Studies





Case Study 1: JohnsonDiversey Distribution Center







Building History Overview

- Building History Operation started on July 1, 2007
 - Built to suit leased building owned by Liberty Property
 - JohnsonDiversey specified levels of <u>LEED-NC</u> and <u>LEED-EB</u> performance:
 - » in RFP and
 - » in Lease Contract





Project History Overview

- LEED Design and Construction Team
 - » Owner: Liberty Property Trust
 - » Lessor: JohnsonDiversey
 - » LEED-NC Consultant: ReVision Architects
 - » LEED-EB Consultant: Leonardo Academy
 - » Lessor Representative: A. Epstein and Sons International
 - » Building Architect: Stephen Perry Smith Architects
 - » Builder: Riley Construction





Project History Bottom Line Overview

- By specifying LEED-NC and LEED-EB performance in RFP and lease agreement and picking great partners who could deliver
 - JohnsonDiversey got a great building with the benefits of both:
 - » LEED-NC achievements of reduced environmental impacts of construction and potential for sustainable performance
 - » A building designed to make it easy to succeed with <u>delivered sustainable performance</u> under LEED-EB





LEED-EB Implementation and Certification

- JohnsonDiversey
 - LEED-EB implementation lead: David Nicklas
 - Building Manager: Bruce Maples
 - LEED Team includes: All internal staff and external service providers that support building operations and Leonardo Academy

Cost of Implementing LEED-EB

 Dave Nicklas, "There is a significant staff time commitment for getting up the leaning curve on implementing LEED-EB. Our goal is for this to become standard practice and not and extra activity. Beyond registration and certification fees and consultant guidance, there are no significant costs for our implementing LEED-EB".

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National Geographic Society Economic Benefits

National Geographic Society Headquarters, Washington DC



•First building certified under LEED-EB

Certified LEED-EB
Silver - November 2003
LEED-EB Recertification
Application Filed:
September 2008





National Geographic Society LEED-EB Costs & Benefits

 Consistent with National Geographic Society mission

Operating cost savings

- Lower energy cost
- Lower water consumption
- Lower waste disposal expenses
- Increased awareness of building operation

Increased Market Value

- Increased building valuation
- Improved equity and debt borrowing capacity





National Geographic Society Filed Recertification Application

- Project leaders:
 - Bob Cline, Director, General Services
 - Richard Neal, Chief Engineer
- Focus is on implementing operational improvements
- Using LEED-EB v2.0





ohnson Controls Brengel Technology Center, Milwaukee, WI



•Initially Certified LEED Silver under LEED-NC in 2000

•Re-certified LEED Gold under LEED-EB March 2004





- 25-30 percent operational savings (maintenance costs, janitorial costs) relative to other similar JCI facilities in Milwaukee area due to LEED Programs (NC and EB)
- No FTEs for maintenance and operations were added, even though 130,000 sq. feet were added





- Reduction in Annual Utility Costs
 - \$91,000 savings per Year (Brengel Center Utilities = \$1.20 per square foot, BOMA downtown Milwaukee average value equals \$1.90 per square foot)
 - Brengel Center uses 0.86 watts per square foot for lighting, Wisconsin energy code is 1.2 watts per square foot





Director of Facilities and Building Services, Ward Komorowski, of Johnson Controls states,

"I spend a good deal of time – at least once or twice a week – giving tours of the facility. Visits to the Brengel's Showcase for Building Environments have been tracked, and they're able to show an impact of \$223M in business."





Contact for Additional Information

Michael Arny President Leonardo Academy 608.280.0255 michaelarny@leonardoacademy.org www.leonardoacademy.org





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