




Newman Consulting Group, LLC
 Consultants for Energy-Efficient and Sustainable Buildings –
 and a Sustainable Planet



**Energy, Sustainability & Environmental
 Issues in Green Buildings**

MS Valley Chapter 123 - ASHRAE DL - 05/11/11



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**AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-
 CONDITIONING ENGINEERS (ASHRAE)**

- Trainer, ANSI/ASHRAE/IESNA Energy Standard 90.1
- Past Member, Industrial A/C and Energy Recovery Technical Committees
- (Local) Past Board Member, 2005 Distinguished Service Award
- Member, Energy Policy Document Committee, 2008
- Distinguished Lecturer, 2010

BUILDING OWNERS & MANAGERS ASSOCIATION (BOMA)

- Member, Energy & Environment Committee
- (Local) Judge, TOBY Awards (The Office Building of the Year)
- (Local) Chair, Sustainability Task Force

ENGINEERING SOCIETY OF DETROIT (ESD)

- Speakers Bureau, 2007 Distinguished Service Award, Fellow (2010)
- Past Chair, Council of Affiliated Organizations
- Member, Construction & Design Committee
- Spokesperson on Energy & Environmental Issues


U.S. GREEN BUILDING COUNCIL (USGBC)

- (Local) Past Board Member, 2008 Distinguished Service Award
- (Local) Past Co-Chair, Public Policy Committee
- (Local) Member, Green Schools Advocacy Committee
- Speaker/Seminar Leader

Why Do People Change?

Only Two Reasons:

1. They *realize* it's in their best interests
2. They're forced to



Both of these are happening today

What's Coming (or Here Now)?

- ANSI/ASHRAE/IESNA Standard 189.1 for High Performance Green Buildings (2009)
- LEED 2009
- ASHRAE Energy Standard 90.1 – 2010 (much tougher than 2007)
- ICC's International Green Construction Code (IGCC) – will be published as new code in 2012 – (input from ASHRAE, AIA, USGBC, IESNA, BOMA, etc.)
- ASHRAE Building Energy Quotient (bEQ) Label (2nd Qtr. 2011 – just finished Beta test– more difficult but more comprehensive than Energy Star)
- Energy Use Index (EUI) – Btu/SF/yr or kW/SF/yr

Why Design Green Buildings?

A. Meet Needs of Today

1. Operating Costs/Energy
2. Building Marketability
3. Occupant Health/Productivity
4. Return on Investment (ROI)
5. Potential Liability

B. Don't Compromise Ability of Future Generations to Meet Their Needs

1. Environmental Responsibility
2. Optimize Resource Efficiency

It's all about People, Planet and Profit

Why "Green" in Today's Tough Times ?

Save Costs

- Natural Resources
- Paper, Waste Recycling
- Travel: Webcasts, Teleconferencing

Improve Productivity

- Indoor Environmental Quality
- *People* are highest cost of a building


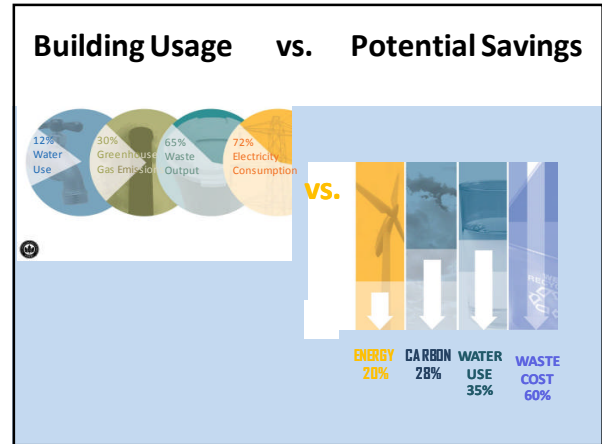
Sustain Financial Viability of Organization

Q: What is a "Green" Building?

A. Intelligent, Integrated Systems

B. Above Standards

C. Costs Less to Operate & Maintain

Q: What is the LEED System?

LEADERSHIP in ENERGY and ENVIRONMENTAL DESIGN

A leading-edge system for certifying DESIGN, CONSTRUCTION and OPERATIONS of the greenest buildings in the world

Scores are tallied for different aspects of efficiency and design in appropriate categories





For instance, LEED assesses in detail:

1. Sustainable Site
2. Water Efficiency
3. Energy & Atmosphere
4. Material & Resource
5. Indoor Environmental Quality
6. Innovation & Design Process

USGBC has four levels of LEED:

Green Buildings worldwide are certified with a voluntary, consensus-based rating system.

Levels of LEED Certification are based on points achieved on a checklist.

Number of points for each level of certification for LEED
 Total points available = 110

Note: Certain prerequisites must be met

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Sample LEED Project Checklist - Partial

LEED 2009 for New Construction and Major Renovations - Project Checklist Summary		Points Available
Prerequisite	Requirement	Points
	Sustainable Sites	
SS1.1	Construction Activity Pollution Prevention	1
SS1.2	Site Selection: Proximity to Transportation	1
SS1.3	Development: Density and Connectivity	1
SS1.4	Site Selection: Proximity to Public Transportation	1
SS1.5	Alternative Transportation: Public Transportation Access	1
SS1.6	Alternative Transportation: Bicycling Paths, Bicycling Routes	1
SS1.7	Alternative Transportation: Carpooling and Fuel Efficient Vehicles	1
SS1.8	Alternative Transportation: Parking Capacity (optional)	1
SS1.9	Site Management: Pattern of Surface Material	1
SS1.10	Site Management: Stormwater Management	1
SS1.11	Stormwater: Design Quality Control	1
SS1.12	Stormwater: Design Quality Control	1
SS1.13	Material Sourcing: Recycled Content	1
SS1.14	Material Sourcing: Recycled Content	1
SS1.15	Light Pollution Reduction	1
	Water Efficiency	
WE1.1	Water Use Reduction	2
WE1.2	Water Efficient Landscaping	1
WE1.3	Innovative Water-saving Technologies	2
WE1.4	Water Use Reduction	2
	TOTAL AVAILABLE POINTS	11

But Is It All About Energy?

Smarter Water for a Sustainable Planet



Q: How many billion gallons of potable water do Americans use *every day* – just to flush toilets?

A: 4.8 Billion Gallons !!

Water Savings

EXTERIOR

- Irrigation
- Water efficient landscaping
- No potable water use or no irrigation
- Watch out for leaks



INTERIOR

- Toilets & urinals (low-flow or waterless)
- Sinks (low-flow, with or without sensors)
- Showers (low-flow)
- Watch out for leaks

Remember, it also requires electrical energy to move the water...

Water Reuse

Water that can be recycled & reused:

Gray Water

- Condensate from (clean) drain pans
- Water from sinks
- Water from washing machines, dishwashers
- Rainwater
 - Collection cisterns
 - "Green" Roofs

Be Careful What You Ask For

- Less potable water being used for flushing toilets
 - Good
 - Conserve water
 - Lower power requirements for water plants
 - Not so good
 - Drains plug up
 - Treatment in waste plants not being rebalanced for higher waste/water ratio

Opportunities for the Building Industry

- ⊙ Alternative Energy Use
- ⊙ Net-Zero Buildings
- ⊙ Energy-Efficient New Building Design and Construction
- ⊙ Energy Efficient O&M in Existing Buildings
- ⊙ Training and Certification of Managers and Operators
- ⊙ Life Cycle Cost Analysis Based Decision Making

Sustainability for ASHRAE

Energy Efficiency

And

Healthy and Productive Indoor Environments

ASHRAE's Strategic Plan for Sustainable Buildings

1. Lead the advancement of sustainable building design and operations.
2. Focus on innovative designs to provide elegant solutions for high performance buildings.
3. Focus on the operation of high performance buildings.
4. Position itself as the premier provider of HVAC&R expertise.

A Key Sustainability Goal: Improved Operating Strategies

The Opportunity:

Improved operational strategies alone could save 10% - 40% in energy.

These savings came about through improvements in software and use of expert knowledge, *not* large capital investment.

Conclusion:

Must first upgrade and then maintain the capabilities of the operations staff. Without ongoing maintenance of skills, building performance will soon slide back to the default value of a poorly operated property.

"Consumers Confused by Green Marketing"

- 97% of Americans think they know what "green" or "environmentally friendly" means
- 41% are incorrect
- 57% distrustful of claims
- 51% overwhelmed by claims
- 79% want detailed info on packaging
- 75% wish companies did better job helping them understand claims

ACHR News – 5/2/11 (Cone Green Gap Survey)

References & Resources

www.ashrae.org
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www.wgbc.org (World Green Building Council)
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www.eren.doe.gov
www.sustainable.doe.gov
www.energystar.gov
www.nrel.gov (Renewable Energy)
www.rmi.org (Rocky Mountain Institute)

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www.peci.org (Portland Energy Council – O & M Techniques)
www.greenseal.org
www.greenguard.org
www.fpl.fs.fed.us/ahrc/mold/mold-methods.html (Forest Products Lab)

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*"If We Do Not Change Our Direction, We Are
Likely To End Up in the Place We Are Headed" –
Chinese Proverb*

For Further Information:

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