

# GREEN BUILDING RATING SYSTEMS

Energy Huntsville Meeting

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**SEA** SAIN ENGINEERING  
ASSOCIATES, INC.

WEEC 2012 • Atlanta, GA

# Overview

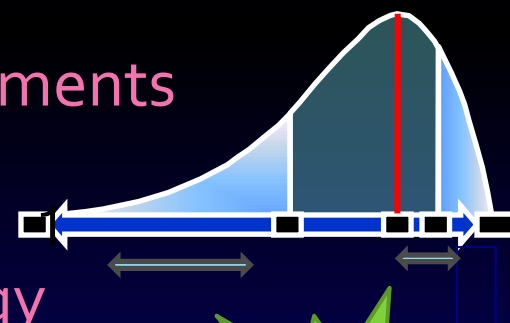
- Energy Star® by the US EPA & DoE
- American Society of Heating Refrigeration and Air Conditioning Engineers, ASHRAE 189.1
- US Green Building Council's – Leadership in Energy and Environmental Design, USGBC - LEED®
- Green Building Initiative's - Green Globes®
- GBI's – Guiding Principles Compliance
  - for federal agencies complying with law and policy





# Energy Star

- Foundational to Green Building Rating Systems (GBRS) with Respect to “Energy”
- Benchmarking with Portfolio Manager (PM)
  - Free Login at [www.energystar.gov](http://www.energystar.gov)
  - Start with last 12 mo. of Utility Statements
- Comparative Metric Scale
  - Based on Commercial Building Energy Consumption Survey (CBECS)



SEA

# Energy Star



Banks



Courthouse



Data Center



Dormitory



Hospital



Hotel



Church



K-12 School



Medical Office



Office Building



Retail Store



Supermarket



Warehouse



Wastewater Treatment



# Energy Star (Portfolio Manager)



- Score 75-100 = Energy Star Rating!
- Score 69 = Min. Prerequisite for LEED-EB
  - Higher PM Scores Add More LEED Credits
- GBI – Green Globes - EB
  - PM Score 75 or Higher
- GBI – Guiding Principles May Use PM
  - Energy Star Rating = Compliance
  - PM Showing 20% Improvement
- ASHRAE 90.1 for Benchmarking Other Situations
  - Non Energy Star Buildings
  - New Construction – LEED or Green Globes



# ASHRAE Standard 189.1

## *High Performance Green Buildings*

- Developed After LEED, Collaborating with
  - USGBC (US Green Buildings Council)
  - IESNA (Illumination Engineering Society of North America)
- Based on:
  - ASHRAE 90.1 2007 - Energy Efficiency
  - ASHRAE 62.1-2007 - Ventilation for Acceptable Indoor Air Quality
  - ASHRAE 55-2004 – Thermal Environmental Conditions for Human Occupancy





# ASHRAE Standard 189.1

## *High Performance Green Buildings*

- It's a **Standard**
  - Not a Design Guide or Rating System
- Applies to All Buildings Except Low Rise Residential
- Intended for Adoption into Building Codes
- Standards Referenced in LEED, and Green Globes.
  - ASHRAE 90.1 2007 - Energy Efficiency
  - ASHRAE 62.1-2007 - Ventilation for Acceptable Indoor Air Quality
  - ASHRAE 55-2004 – Thermal Environmental Conditions for Human Occupancy





# Green Building Rating Systems

- Provide a Framework of **Measurable Goals** in the Construction or Operation of Buildings in Five Broad Areas:
  - Sustainable Sites
  - Water Efficiency
  - Energy Efficiency and Renewable Energy
  - Conservation of Materials and Resources
  - Indoor Environmental Quality
- Achieving Goals with a Documented Review Process
- Point or Credit Tally Indicate Relative **Sustainability**
- The Building and the Processes
  - Design, Construction, and Operation

# Green Building Rating Systems

- **Environmental** - reduced impacts on natural resource consumption
- **Economic** - savings through efficiency and productivity
- **Health and Safety** - enhanced occupant comfort/health
- **Community** - minimize strain on local infrastructures and improve quality of life
- **Increased Building Valuation** - use the formula: asset value increases at ten times the reduction in annual operating cost per sq. ft basis (CAF)
- **Decreased Vacancies** - improves tenant retention & gives a marketing edge
- **Improved Productivity** – through greater occupant comfort... productivity gains impacting salary and benefits costs, far outweigh small increase in building costs.



# USGBC - LEED

- LEED – Leadership in Energy and Environmental Design formed in 1993 for new construction
- Standards target:
  - New Construction (Commercial)
  - New Homes
  - Core and Shell
  - Commercial Interiors
  - Operations and Maintenance
  - Neighborhood Development
  - New Construction or Interiors tailored for:
    - Schools
    - Healthcare
    - Retail



# USGBC - LEED

- Sustainable Sites 26 possible points
- Water Efficiency 10 possible points
- Energy & Atmosphere 35 possible points
- Materials & Resources 14 possible points
- Indoor Environmental Quality 15 possible points
- Innovation & Design Process 5 possible points
- Regional Priority 4 possible points

## 4 Levels of Certification

- Certified 40-49
  - Silver 50-59
  - Gold 60-79
  - Platinum 80 and above
- Point allocations vary for NC, EB, CS, etc.



# The Green Building Initiative (GBI) & Green Globes



- GBI Founded in 2004
- Became an American National Standards Institute (ANSI) "Standards Developer" - 2005
- Developed Green Globes from ANSI /GBI 01-2010: Green Building Assessment Protocol for Commercial Buildings
- Based on the Building Research Establishment (BRE) in UK, and their Environmental Assessment Model, or BREEAM.
- BREEAM moved to Canada and the US/Canada Green Globes was formed



# The Green Building Initiative (GBI) & Green Globes



- Differences from LEED
  - Unique web based survey tool to assemble documentation showing goal achievement
  - Third Party On-Site Assessors to complete certification
  - Lower total cost
  - Perceived to be simpler
  - New version of Green Globes-NC Rating System incorporates Guiding Principles Compliance



# The Green Building Initiative (GBI) & Green Globes



- Differences from LEED
  - No prerequisites (except 35% preliminary rule)
  - 1000 vs. 100 point scale allows a more granular response to goals
  - Dialogue with third party assessor with professional judgment
  - Partial credits possible
  - These result in the most objective score



# The Green Building Initiative (GBI) & Green Globes



- GBI offers the following Standards
  - Green Globes – NC (New Construction)
  - Green Globes - CIEB  
(Continual Improvement for Existing Buildings)
  - Green Globes CIEB for Healthcare
  - Guiding Principles Compliance



# The Green Building Initiative (GBI) & Green Globes



- Green Globes ( 1, 2, etc.) similar to LEED – Certified, Silver, Gold, Platinum

<u>Rating</u>	<u>% of 1000 point</u>	<u>represents....</u>
1 Green Globe -	35-54%	Commitment
2 Green Globes	55-69%	Excellence
3 Green Globes	70-84%	Leadership
4 Green Globes	85-100%	National Leadership



# GBI – Guiding Principles Compliance



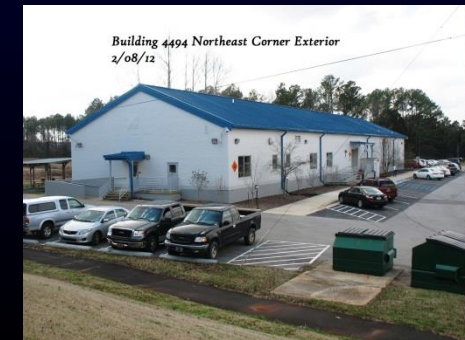
- Developed for Federal Buildings
- Based on:
  - Energy Policy Act of 2005 (EPact 2005)
  - Federal Leadership in High Performance and Sustainable Buildings – MOU ~2006
  - Energy Independence and Security Act (EISA 2007)
  - Executive Order 13423 - 2007
  - Executive Order 13514 – 2009
- Developed where other GBRS were good but were inconsistent with Federal law or policy
- Green Globes NC version 4, released June 4, 2013 now incorporates GPC

# Others

- IGCC – International Green Construction Code
  - International Code Council
  - intended for adoption as a lawful building code
- National Green Building Standard – ICC700
  - National Association of Home Builders
- GreenPoint Rated - Build It Green
- Earth Craft -
  - Southface & Greater Atlanta Home Builders Association
- Living Building Challenge
- 20+ other standards in other countries

# EXAMPLES

- NASA building 4203 – LEED-EB
  - 230,000 sf, 6 story office
  - Retro-commissioning
- NASA Building 4494 – LEED-NC
  - ~10,000 sf, 1 story, major renovation
  - 18 energy credits, & 30% increased ventilation
- NASA building 4707 –  
Guiding Principles
  - 116,000 sf , LAB building,  
high bay and vertical assembly spaces.



# Questions?

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